A REPORT ON THE HEALTH OF BRITISH COLUMBIANS

PROVINCIAL HEALTH OFFICER'S ANNUAL REPORT 2002

The Health
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PROVINCIAL HEALTH
OFFICER'S ANNUAL
REPORT 2002

BRITISH
COLUMBIA
Ministry of Health Planning
Office of the
Provincial Health Officer

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Ministry of Health Planning

Victoria, B.C.

November 26, 2003

The Honourable Sindi Hawkins

Minister of Health Planning

Madam:

I have the honour of submitting the Provincial Health Officer's Annual Report for 2002.

P.R.W. Kendall, MBBS, MSc, FRCPC

Provincial Health Officer

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HIGHLIGHTS

Highlights

The *Provincial Health Officer's 2002 Annual Report* details progress towards achieving British Columbia's health goals. Established in 1997, these interlinked health goals are broad statements of intent and aspiration. The indicators described in this report provide tangible social, economic, environmental, and health targets for focusing our collective efforts and improving the health and well-being of B.C.'s citizens and communities.

The *Provincial Health Officer's 1999 Annual Report: The Health Of British Columbians* was the first report on the health goals and the progress towards achieving them. This 2002 Annual Report provides an update, tracking health trends into the 21st century and further charting our progress in enhancing the health of British Columbians.

For each health goal, indicators were chosen to measure progress. Health indicators are also useful tools for setting direction and improving accountability.

Over the last decade, many organizations have been establishing health goals and indicators in order to measure health care performance and highlight areas where more work needs to be done. Health goals and indicators are now being used nationally in all provinces in Canada and by the Canadian Institute for Health Information in collaboration with Statistics Canada. For the first time, B.C.'s six regional health authorities have set performance targets and indicators. These are now written into yearly performance contracts with the provincial government. This widespread focus on targets and indicators is a positive trend that will help improve accountability and performance, and help focus our efforts and resources on actions that can make the most difference in improving the health of the population.

Six Health Goals

Over the last three decades it has become increasingly apparent that good health depends on much more than health services. Good jobs, access to education, a stable economy, a supportive and well-functioning family, and a clean and safe environment impact the health of individuals and the population as a whole. These social determinants of health are clearly reflected in B.C.'s health goals.

Along with measuring health status, British Columbia's six health goals include measures of:

- Positive and supportive living and working conditions in all our communities – Health Goal 1.

- Opportunities for all individuals to develop and maintain the capacities and skills needed to thrive and meet life's challenges and to make choices that enhance health – Health Goal 2.
- A diverse and sustainable physical environment with clean, healthy and safe air, water and land – Health Goal 3.
- An effective and efficient health service system that provides equitable access to appropriate services – Health Goal 4.
- Improved health for Aboriginal peoples – Health Goal 5.
- Reduction of preventable illness, injuries, disabilities and premature death – Health Goal 6.

In total, 91 indicators are examined to reflect how well we are doing in reaching each health goal in British Columbia. Some of the most important and interesting highlights are presented here. For a more in-depth discussion on each indicator and future trends, see the relevant chapter and Appendix C, which provides each indicator's definition and data source. Regional differences among indicators and trends are found in Appendix D.

Overall Trends

As this report shows, British Columbia has made progress and improvements in the population's health and wellness. Of the 91 indicators, 41 show positive or improving trends. Over the last few years, British Columbia has continued to maintain and make gains in long-established health measures, such as increases in life expectancy and reductions in premature deaths. For the first time, B.C. now leads the country in having the highest-educated working-age population. The number of people on income assistance continues to decline. The crime rate continues to fall. Fewer people than ever are smoking tobacco, giving B.C. the lowest percentage of smokers of any province in Canada. Fewer people are being injured on the job. Fewer teenage girls are becoming pregnant. Our province has exceeded the national target for protecting land areas in their natural state. Each year, more people are getting influenza immunizations, preventing illnesses, avoiding unnecessary hospitalizations, seeking help to stop smoking, and getting the assistance they need to look after their own health. Death rates for heart disease, stroke and cancer have also dropped.

Significantly, we also observed improvements in the health status and health determinants of specific populations. Aboriginal peoples, although having significantly lower health status, are experiencing lower infant mortality rates, increased life expectancy, and fewer premature deaths. More Aboriginal British Columbians are completing high school than ever before. Fewer B.C. families headed by single-mothers are living in poverty. More seniors in B.C. are living longer with fewer disabilities and better quality of life.

For some health measures, data show stable or less encouraging trends. For 31 indicators, health trends have remained relatively unchanged. After many years of decline, the infant mortality rate appears to have leveled off and 2002 shows a statistically non-significant increase in infant deaths. This is the subject of an in-depth review. The rate of low birthweight babies has remained stable for about two decades. Among B.C.'s population, rates of hip fractures, tuberculosis cases and mental health hospitalizations have remained unchanged and could be lowered.

Of all the indicators, 14 show a negative trend. Data indicate that more people are drinking heavily. More women are having caesarean sections and the prevalence of chronic conditions has increased. Greenhouse gas emissions are worsening, and the number of boil-water advisories is increasing. Slightly more inspected restaurants have potential health hazards.

Focus on Seniors

B.C.'s aging population is an important element in the progress towards achieving the province's health goals. Over the next thirty years, the proportion of B.C. residents over the age of 65 will continue to increase annually, from 13.3 per cent of the population in 2002 to 23.3 per cent by 2030.

Throughout the report, data about seniors are presented for each health goal. B.C.'s seniors population is diverse. In general, seniors age 75 and older face more health problems than those under age 75. Almost half of the 91 health indicators have data by seniors' age groups. Some health indicators are irrelevant to the seniors' population, such as low birthweight and teen pregnancy rates, while others have no data available by age groups.

In general, the majority of B.C.'s seniors are aging well and living longer. Two thirds of seniors rate their health as either good or very good. Seniors continue to contribute to society and the health care system by volunteering with hospitals, hospices and community programs. Seniors also provide a substantial portion of informal care giving. Fewer female seniors are now living below the poverty line, with 10.2 per cent considered under the low-income threshold set by Statistics Canada. Nationally, the majority of seniors are homeowners and 64 per cent are mortgage-free, the highest proportion of any age group. Seniors have the lowest proportion of smokers and heavy drinkers of any age group and eat a healthier diet than most other British Columbians. Most seniors (94.5 per cent) continue to live independently or with moderate support in the community or with their families, rather than in care facilities.

Seniors in B.C. do have a greater share of health concerns than younger generations. They have higher rates of cancer, heart disease, high blood pressure, and stroke than other age groups. While they represent 13.3 per cent of B.C.'s population, seniors account for 36.5 per cent of hospitalized cases and 55 per cent of all inpatient days. At least 20 per cent of the hospital days spent by seniors are rated as "alternative level of care" (ALC) days, meaning seniors are waiting in an acute care bed for more appropriate services such as home support, community care, or placement in a care facility. Seniors with mental illness are the least likely to receive follow-up care from physicians or community mental health services after hospitalization.

While most are healthy, some seniors are isolated and alone with insufficient income or social support. These are often women who have outlived their partners. The increasing diversity of seniors, and the growing population of seniors living in urban centres, highlights the need for policies and programs that help seniors stay socially connected, identify seniors in need, and provide assistance for keeping them independent and healthy.

Priority Actions and Recommendations

For each health goal, recommendations are presented for B.C. residents and their families. This report also outlines recommendations for health regions, municipalities and the provincial government, where applicable.

This annual report also highlights many recurring themes for B.C.'s health goals. These are summarized in the following top ten essential actions for individuals and top ten actions for policy-makers. In almost all cases, the recommended actions for helping individuals achieve good health require informed social policy, effective public health programs, and targeted government action.

Individuals

Individuals have a great deal of control over their health and quality of life. Although well-known, the top 10 list of good health habits and choices are worth repeating here. They are:

1. **Don't smoke.** Tobacco smoking contributes to and causes various health concerns and illnesses. If you are a non-smoker, don't start and help make sure that your children don't smoke either. If you are a smoker, seek help to quit. If you can't quit, cut down as much as possible.
2. **Eat a balanced, healthy diet.** Follow Canada's Food Guide to Healthy Eating. Limit your intake of sugars and dietary fat, particularly hydrogenated and saturated fat, and eat plenty of whole grains, fruits and vegetables. Make healthy choices and order smaller portions when eating out.
3. **Remain physically active.** You don't have to enter a triathalon, marathon, or take endlessly punishing exercise classes. Simply move whenever and wherever you can by walking frequently, taking the stairs, dancing, gardening, biking, or getting off the bus a few stops early. As little as three 10-minute sessions of moderate to intense activity everyday – or an hour of exercise three times a week – is enough to start improving health. You may find that once you get moving it not only makes you feel healthier but also happier. Encourage your children, family and friends to stay active and help them participate in healthy activities.
4. **Drink alcohol responsibly.** One glass of wine or beer for women and two for men a day has been shown to confer moderate health benefits. Non-drinkers do not need to start drinking but heavy drinkers should cut down to these levels. Any health benefits of alcohol rapidly disappear with excessive regular drinking or binge drinking and lead instead to increased health problems. If you or a member of your family has a problem with excessive drinking, seek help. Never drink and drive.
5. **Practice safe sex.** Use a condom with a new partner. Know each other's sexual history and risk factors. Avoid multiple or anonymous partners. Get tested for sexually transmitted diseases after becoming intimate with a new partner. Talk to your children about responsible sexuality.

6 **Use preventive services.** Immunize your children. If you are over 65, have a chronic health condition, or work as a health professional, get your flu shot. Contact your doctor, nurse or local health unit for more information. If you are a woman, ensure you have regular Pap tests once you become sexually active. If you are a woman between the ages of 50 and 70 years, have a regular mammogram. If you or someone you know is being abused or needs emotional or physical support, contact one of the community agencies listed on the inside cover of your phone book.

7 **Use safety devices.** Wear seat belts when driving. Wear a helmet when cycling, rollerblading, skateboarding, motorcycling or scootering. Wear life jackets on or near the water. Have working smoke detectors and fire extinguishers in your home.

8 **Protect yourself and your children from the sun.** Wear sunscreen, seek shade, wear a hat and long-sleeve shirt, and avoid direct sun between 10 a.m. and 3 p.m. Seek medical advice if you have a changing mole.

9 **Learn basic first aid.** Learn which common health complaints can be treated safely and more comfortably at home, and learn which types of health concerns must be handled by a doctor, nurse or other health professional. For health information and advice, see your B.C. HealthGuide Handbook, visit the Web site at www.bchealthguide.org, or call the B.C. NurseLine toll-free at 1-866-215-4700 and speak to a registered nurse. Learn CPR and other life-saving techniques, like the Heimlich-maneuver for choking. Have a first aid kit in your home and vehicle.

10 **Adopt an attitude of lifelong learning.** Education and good health go hand-in-hand. Encourage your children to stay in school. Seek higher education where possible, either by learning a trade, or completing a diploma or degree. Go back to school, take a course, or read a book. And remember to read to your children. If reading is difficult for you or someone you know, seek help. Continue to learn for life.

Local, Provincial and National Governments

While the top ten actions for individuals listed above will go a long way to improve individual and family health, not everyone has the same abilities, opportunities, or life circumstances to enable them to make healthy choices. The role of government is to provide equitable access to appropriate services and programs to help improve the health of citizens. Governments at all levels need to work together to develop policies and programs that provide support for people to make healthy choices, participate in healthy activities, and change detrimental health behaviors. Many health promotion and illness prevention programs are established or are being expanded to meet population health needs, such as universal childhood immunization, screening mammography, and pap test programs. Government has an important role in ensuring that healthy options are accessible and affordable for all individuals and that the healthy choice is the easier choice.

It has become clear that poverty, lack of education, unemployment, poor housing, drug and alcohol abuse, poor diet and unstable family life are highly predictive of poor health. Government programs that reduce social inequities, mitigate the impacts of low socio-economic status, and target known risk factors will have more health impact than simply providing services for disease-based outcomes.

The top ten government actions are:

1 **Support healthy child development.** Ensure pregnant women continue to have access to a wide range of prenatal services, including adequate food and vitamin supplementation for women with low incomes. Make it a priority to provide support for Aboriginal communities to develop culturally appropriate early childhood development programs, parent education and support initiatives. Make quality childcare and other childhood services available to all children and families.

2 **Make equal access to quality education a priority.** Provide programs and supports for school completion, paying attention to disadvantaged students. Ensure that access to post-secondary education remains affordable and available to qualified students, and provide student loan programs.

3 **Create a healthy, diverse economy.** A thriving economy improves the health determinants for most citizens. However, government needs to ensure they are not simply widening inequalities. Economic growth must benefit all British Columbians.

4 **Provide supportive programs and policies to protect the disadvantaged.** Improve social programs and create tax policies that reduce growing inequalities in income. Increase the availability of affordable housing. Work to lower unemployment rates. Support breakfast food programs at schools and other targeted programs that meet communities' needs. In particular, work with Aboriginal peoples to improve their health status and address the social, cultural, economic and spiritual determinants of health.

5 **Implement evidence-based programs to promote non-smoking, responsible alcohol use, regular physical activity, healthy eating and other healthy behaviours.** People need support and creative programs to encourage them to adopt healthier lifestyles. Where these programs are lacking, support research and pilot projects to determine what works to promote healthy behaviours.

6 **Continue to support and expand broad public health programs.** Public health programs such as universal childhood immunization, flu immunization, food and water testing, communicable disease surveillance and control, and programs to prevent chronic disease and unintentional injury need continued support.

7 **Continue to support and expand programs that help citizens become wiser health consumers.** B.C. HealthGuide, B.C. OnLine and B.C. NurseLine provide 24/7 access to health information and advice to British Columbians. These services provide support and assistance to individuals and families on how to stay healthy, home remedies, when to access health services and where to find specialized services. It is also important to ensure seniors have easy access to information about available programs and services.

8 **Be committed to health research, analysis of trends and evaluation of programs, particularly for new policy directions.** Health indicators help assess progress towards achieving health goals. Importantly, all government policies and programs should include research and evaluation to determine if they improve the health and wellness of British Columbians.

9 **Continue to build an evidence-based culture focused on appropriate health care services.** Support health services that are shown to improve health and wellness. Where ever possible ensure that people receive necessary care at the right level, such as using primary care and chronic disease management to maintain health and avoid the escalation of complications, invest in and provide home care and supportive community care to avoid hospital admissions, and reserve hospital care for those health problems that cannot be treated more effectively or safely in other venues.

10 **Create safer and healthier indoor and outdoor environments.** Promote injury prevention, improve occupational health and safety, and encourage community planning that promotes healthy living. Have programs to improve air, food and water quality, and reduce exposure to harmful contaminants. Take action to reduce and mitigate the impacts of global warming and climate change.

In future years, British Columbia will continue to follow progress towards achieving the six health goals. The actions recommended here if implemented will help ensure improvements in the health and wellness of all British Columbians.

Chapter 1

INTRODUCTION

The Provincial Health Officer's 2002 Annual Report updates British Columbia's progress towards achieving the provincial health goals. Established in the 1997, these interlinked health goals are broad statements of intent and aspiration. They describe tangible social, economic, environmental and health targets toward which to focus our collective efforts to improve the health and well-being of British Columbia's citizens and communities.

The Provincial Health Officer's 1999 Annual Report: The Health Of British Columbians was the first report to closely examine the health goals and progress towards achieving them. This second document provides an update on that progress and follows the trends into the 21st century.

Linking Past Actions To Future Progress

Over the last decade it has become increasingly clear that in order to improve the health of individuals and the population at large, we must establish goals for the future and then ensure we are working towards them. In many nations, the process of setting health goals and evaluating progress towards them is well established. In the past, the focus was on simply recording how much money was being spent on health care and related activities. Now the focus is shifting to setting measurable objectives to determine whether our efforts and resources are actually resulting in better health for individuals and society.

In addition, research by population health experts and social scientists indicates that to improve health we cannot focus only on delivering health services. We also need to address the social, economic and environmental factors that influence health and well-being. Factors such as how we work and live, the quality of the air we breathe, the food we eat and the water we drink, and our relationships with others all have a bearing on our health.

In the early 1990s, acting on one of the recommendations of the B.C. Royal Commission on Health Care and Costs, British Columbia started working on establishing provincial health goals to reduce health inequities, to raise awareness of all the factors that affect our health, and to link policy and funding to health outcomes.

British Columbia's Provincial Health Officer (PHO) was given the task of developing the health goals. The process took a number of years and in 1997, six comprehensive health goals were established by the PHO and approved by the provincial government. These health goals, along with the traditional public health measures of health status, encompassed improving living and working conditions, personal capacities and skills, physical environments, health services, aboriginal health, and reducing preventable illness and injury.

FRAMEWORK FOR MEASURING PROGRESS TOWARD B.C.'S HEALTH GOALS

Health status
- Well-being
- General health
- Health conditions
- Deaths

Goal 1 – Living & working conditions
- Employment
- Income
- Participation and social integration
- Housing

Goal 2 – Individual skills, capacities & choices
- Healthy child development
- Learning opportunities
- Healthy choices
- Independent living

Goal 3 – Physical Environment
- Air
- Water
- Food
- Land and soil
- Sustainability

Goal 4 – Health Services
- Accessibility
- Doing the right things right
- Improving health

Goal 5 – Aboriginal Health
- Health status
- Factors affecting health

Goal 6 – Disease and Injury Prevention
- Non-communicable diseases
- Communicable diseases
- Injuries

Along with establishing health goals, the PHO established a set of indicators – standardized statistics, measures or data sources – to determine whether a goal is being achieved. For example, the number of teenagers who smoke tells us the effectiveness of anti-smoking programs and the potential incidence of tobacco-related illnesses in the future.

Initially, 150 indicators were put forward as potential data sources that could be used to measure performance. This large list was further refined to 93 indicators. The Office of the Provincial Health Officer, as part of its role to report annually on the health of British Columbians, released the first report on achieving the health goals. The 1999 Annual Report used the 93 indicators as a framework not only for the provincial government but also for B.C. residents to use to improve health.

This 2002 Annual Report updates and reviews the 1999 Annual Report with new data collected from 1999 to 2002.

LENS ON SENIORS' OUTCOMES

Like the rest of Canada, B.C.'s population is rapidly aging. The proportion of B.C. residents over the age of 65 will continue to increase annually, from 13.3 per cent of the population in 2002 to 13.8 per cent in 2005 and 14.7 per cent by 2010. By 2030, 23.3 per cent of British Columbians will be over age 65.

In 2002, 551,820 people in B.C. were over the age of 65, of whom 53 per cent were "younger seniors" age 65 to 74 years, and the remaining were older seniors, 75 years or more in age.

Aging brings a unique perspective to health status and provincial health goals. In this report we will view each of the six health goals, as well as health status, through a seniors' lens.

These seniors' snapshots will be presented in shaded boxes throughout the document at the end of each chapter.

Update on Health Indicators

In this report, the indicator framework and 91 of the original 93 indicators are the same or very similar as those used in the 1999 Annual Report, enabling consistency and comparisons over time.

In the 1999 Annual Report, two indicators for chronic disease were used, one tracking chronic diseases that were improving and the other tracking chronic diseases that were worsening. These patterns did not hold true for this round of data so the two indicators have been combined into one for this report.

SEE APPENDICES FOR MORE DETAILS

More detailed reference information for this report on the sources, indicators, contributors, literature references and regional data can be found in the one of the following appendices:

Appendix A:	People and organizations that contributed to the report.
Appendix B:	Literature references.
Appendix C:	Definition and rationale for each indicator.
Appendix D:	Tables on regional data for the indicators by HSDAs.
Appendix E:	Seniors data
Appendix F:	Map

The second indicator dropped in this report is "improved health behaviors" (Pregnancy Outreach Program), in goal 4. Comparative data for pregnancy are no longer collected by the Pregnancy Outreach Program and no alternative sources exist. In addition, many individual health behaviors, such as bicycle helmet use and cessation of smoking, are already covered under goal 2.

The Provincial Health Officer continues to research valid and reliable indicators. Health indicators are not perfect tools, but they are useful for monitoring our health, measuring our progress and suggesting new targets to achieve. They also provide a gauge of how well the health goals are met. Data for several indicators used in previous reports are no longer collected or they are collected using different methodologies. Therefore, several new indicators or variations of existing indicators have been included in this report. Their utility and limitations are also discussed. Recent data are not available for 5 of the 91 indicators. In some cases, the gaps are addressed by using proxy measures to illustrate general trends.

Data Sources

Data for the indicators used to measure the health status and B.C.'s health goals in this report were obtained from the following key sources:

- **National Population Health Survey (NPHS)**
  The NPHS is a Statistics Canada longitudinal study that interviewed the same 17,000 households every two years from 1994 through 1998. It was one of the main data sources for the 1999 Annual Report and so forms a basis of the trends cited in this report. Age, gender, education, ethnicity, household income and other socio-economic data, as well as some specific health-related data, were collected. Indicators such as self-rated health, chronic conditions, mental illness and physical activity are taken from this survey and the survey below.

- **Canadian Community Health Survey (CCHS)**
  Statistics Canada modernized its Health Survey program by implementing a more comprehensive cross-sectional survey designed to better address sub-provincial needs. In 2000/01 it conducted the CCHS, which represents Statistics Canada's largest survey outside of the census. The CCHS uses many of the same survey questions as the NPHS. However, it represents a much larger sample as more than 130,000 respondents ages 12 and over were interviewed in person or by telephone. This survey covers all ten provinces and three territories. However, due to the change in sample size and methodology, there are a few instances in which it is not clear whether trends are due to changes in methodology between the NPHS and the CCHS or real societal changes, or both. These instances will be noted in this report.

  For both the NPHS and the CCHS, this report uses Statistics Canada's Web site (http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm) to extract data on many of these indicators by geography, years, age and gender. For more specific or detailed information, the report uses the Share Files from the CCHS, which contain data for British Columbia for every question asked.

- **2001 Census**
  Every five years, Statistics Canada conducts the Census of Population to develop a statistical portrait of Canada and its people. The census describes many characteristics including the demographic, social and economic make-up of its people. Data collected cover all provinces, territories, cities and

districts. Several indicators in this report were taken from the most recent census conducted in May 2001. Income, education levels and living arrangements for seniors are some of the indicators from the census. It is also the source for three Aboriginal health indicators.

- **British Columbia Vital Statistics Agency, B.C. Ministry of Health Planning**
  The British Columbia Vital Statistics Agency has been collecting and publishing birth, death and marriage statistics for the province for more than 130 years. The agency provided the data for indicators such as infant mortality, low birthweights, neural tube defects and suicide deaths.
- **BC STATS, B.C. Ministry of Management Services**
  This agency provides most of the provincial government's statistical products, services and expertise. Many agencies that provide indicators in this report use the population estimates provided by BC STATS to calculate rates per standard population. This report also relies on this central statistical agency, for data collected at the national level and for indicators at the regional level.
- **Administrative Databases from Government Ministries and Web Sites**
  Many government ministries including Health Services, Health Planning, Education, Children and Family Development, Human Resources, Water, Land and Air Protection, Public Safety and Solicitor General also collect information to measure their service plan performances. Several service plan indicators used are the same indicators for the health goals used in this report. Data were obtained from ministry Web sites, published reports or administrative databases.

Other data sources include the annual reports from the B.C. Center for Disease Control (BCCDC), B.C. Cancer Agency, B.C. Workers' Compensation Board, Canadian Tobacco Use Monitoring Survey, and Statistics Canada's National Longitudinal Survey of Children and Youth.

Other Health Indicator Developments

As we noted in the 1999 Annual Report, the establishment of reliable health indicators is a developing science. A great deal of activity has occurred towards identifying and reporting health indicators over the last five years. Some of this activity we detailed in the 1999 Annual Report, including the World Health Organization's report assessing the health performance of various countries, and the United Nations Development Programme's Human Development Report measuring progress on various indicators of human development.

In 1999, a core set of health indicators relating to the health of the population and the health care system was identified at the first National Consensus Conference on Population Health Indicators. This conference was convened by the Canadian Institute for Health Information (CIHI) in cooperation with the

CANADIAN HEALTH INDICATOR FRAMEWORK

Health status:
- Health Conditions
- Human Function
- Well being
- Deaths

Non-Medical Determinants of Health
- Health Behaviors
- Living and Working Conditions
- Personal Resources
- Environmental Factors

Health System Performance
- Acceptability
- Accessibility
- Appropriateness
- Competence
- Continuity
- Effectiveness
- Efficiency
- Safety

Community and Health System Characteristics
- Community
- Health System
- Resources

Federal/Provincial/Territorial Advisory Committee on Population Health and Health Services, Health Canada and Statistics Canada. The Canadian Health Indicator Framework, as shown here, has many similarities with B.C.'s Health Goals framework. This national framework is the basis of CIHI's annual reports on the performance of Canada's health system. CIHI's indicators are used each year by Maclean's Magazine to compile simplified rankings of health system performance across the country.

Nationally Comparable Indicators

In a related development in September 2000, Canada's First Ministers agreed to provide clear reporting to all Canadians about nationally comparable performance indicators, beginning in 2002. Under the agreement, common indicators were chosen in 14 areas of health status, health outcomes and quality of health services. Each jurisdiction is responsible for reporting on these areas with the assistance of CIHI and Statistics Canada. For 2002, a total of 67 indicators were identified in the 14 areas.

In September 2002, the B.C. Ministry of Health Planning released its first report on these nationally comparable indicators, *How Healthy Are We?* The 75-page report notes the province's progress in life expectancy, infant mortality, burden of disease and injury, wait times for key diagnostic services and treatments, patient satisfaction and other measures of service quality. A brochure is available summarizing the key findings of the larger report. Both documents can be found on the B.C. Ministry of Health Planning Web site at: http://www.healthplanning.gov.bc.ca/cpa/publications/how_healthy_highlights.pdf

How Healthy Are We? reported on a different set of indicators than this PHO report, but in general the findings are highly comparable. The document notes that British Columbians enjoy among the highest health status in the world. British Columbians have an average life expectancy of 80 years, lower infant mortality rates and fewer low birthweight infants than any other province, and seniors who tend to live more years without disability than the Canadian average. However, some trends highlighted by the report are worrisome. Lung cancer in women has doubled over the last 25 years, more than one in eight seniors has diabetes, and more than 40 per cent of British Columbians are overweight. British Columbia will report again on these national indicators in 2004.

Table 1.1 summarizes recently published national and provincial reports and resources for performance indicators.

TABLE 1.1 PUBLICATIONS AND WEB SITES FOR PERFORMANCE INDICATORS

Publications and Web Sites	Author	Summary of Contents
National Level: *Health Care in Canada, 2003.* www.cihi.ca	Canadian Institute for Health Information (CIHI) and Statistics Canada.	The fourth annual report contains information on health status, patient outcomes, health care professionals, associated costs and resources.
Provincial Level: *How Healthy Are We? British Columbia's Report on National Comparable Performance Indicators,* September 2002. www.healthplanning.gov.bc.ca/cpa/publications/how_healthy_sept2002.pdf	B.C. Ministry of Health Planning	Meeting its national commitment to standardized accountability, B.C. reports on fourteen specific indicator areas, covering health status, health outcomes, and quality of service.
Provincial Level: *BC Progress Board, Toward British Columbia North Star 2010: Second Annual Benchmarking Report of the BC Progress Board,* December 2002. http://www.bcprogressboard.com/report2.html	B.C. Progress Board	An independent board appointed by Premier Gordon Campbell, the Progress Board has established goals, targets and measures to evaluate B.C.'s progress compared to other jurisdictions. These include primarily economic indicators and also several environment, health and societal indicators.
Provincial Level: *British Columbia Regional Indicators,* April 2003 www.bcstats.gov.bc.ca/data/sep/index.htm	BC STATS, B.C. Ministry of Management Services	An inter-ministry initiative coordinated by BC STATS, this Web site contains information on social and economic indicators by local health areas and other geographical breakdowns such as college regions.
Provincial Level: Health Data Warehouse www.hdw.moh.hnet.bc.ca/	B.C. Ministries of Health Services and Health Planning	By request, this in-house Web site is made available to researchers or other government officials in the B.C. ministries and health authorities. It contains data on a wide variety of topics including the indicators for the health goals.
Provincial Level: *The Health and Well-Being of Aboriginal Children and Youth in B.C.,* June 2002. *Indicators of Early Childhood Health and Well-Being in British Columbia,* January 2003. http://www.mcf.gov.bc.ca/publications/title.htm#M	B.C. Ministry of Children and Family Development	These documents use sets of indicators to measure and report on the health and wellness of children in British Columbia.
Provincial Level: *Environmental Trends in British Columbia 2002* http://wlapwww.gov.bc.ca/soerpt/publications.html	B.C. Ministry of Water, Land and Air Protection	The third environmental report since 1998 from the province, it follows the progress and trends of 16 key indicators. Many of these impact the health and well-being of the population, including air quality, water quality, toxic contaminants, greenhouse gas emissions, climate change, and habitat protection.
Provincial Level: *State of the Fraser Basin Report,* January 2003 www.fraserbasin.bc.ca	Fraser Basin Council	Established in 1997, the non-profit Fraser Basin Council's mandate is to protect and advance the social, economic and environmental sustainability of the Fraser River Basin, home to 2.6 million British Columbians and 80 per cent of the provinces' GDP. The report includes analysis of trends for three sustainability components, many of which are also health-related indicators.
Health Authority Level: *Fraser Health Authority Health Profile 2001*	Fraser Health Authority	Socio-economic indicators, health status and delivery of services by Local Health Areas are key topics covered in this report.

Health Goals Framework Compared To New Era Commitments

Originally, B.C.'s health goals were established to serve as a guide for creating a unifying policy framework for government planning. This outcome was not explicitly achieved. However, the concepts underlying the health goals were used in ministry's business plans (See report, *Policy and Practice - A report on the use of B.C.'s health goals by B.C. Government Ministries,* Web site: http://www.healthplanning.gov.bc.ca/pho/hlthgoals.html).

The heath goals are still used by communities and organizations in B.C. With the change in government in June 2001, the *New Era Statement* for British Columbia has become the primary structure for government strategic plans and ministry service plans. (The *New Era document* is available at www.bcliberals.com/policy.)

Ministries whose mandates also encompass the broader societal goal, including Children and Family Development, Education, Human Resources, and Water, Land and Air Protection, have also established performance goals and indicators that reflect some of the health goals.

TABLE 1.2 HEALTH GOALS CONCORDANCE WITH NEW ERA VISION STATEMENTS

New Era Vision Statements	Health Goals
Vision Statement 3: A thriving private sector economy that creates high-paying job opportunities. **Vision Statement 4:** Safer streets and schools in every community.	**Goal 1: Living and Working Conditions:** Positive and supportive working conditions in all our communities.
Vision Statement 1: A top-notch education system for students of all ages. **Vision Statement 8:** Greater equity and equality for British Columbia in Canada.	**Goal 2: Individual Capacities, Skills and Choices:** Opportunities for all individuals to develop and maintain the capacities and skills needed to thrive and meet life's challenges and to make choices that enhance health.
Vision Statement 7: A leading-edge forest industry that is globally recognized for its productivity and environmental stewardship.	**Goal 3: Physical Environment:** A diverse and sustainable physical environment with clean, healthy and safe air, water and land.
Vision Statement 2: High-quality public health-care services that meet all patients' needs where they live and when they need it.	**Goal 4: Health Services:** An effective and efficient health service system that provides equitable access to appropriate services.
Vision Statement 5: Better services for children, families and First Nations.	**Goal 5: Aboriginal Health:** Improved health for Aboriginal peoples.
10-year health strategy: Intensify efforts to promote wellness and preventive care through better education, dietary habits and physical activity.	**Goal 6: Disease and Injury Prevention:** Reduction of preventable illness, injuries, disabilities and premature deaths.

Performance Targets and Monitoring

Since 2001, the previous Ministry of Health has undergone major restructuring into two new health ministries. The Ministry of Health Services is focused on the day-to-day management and delivery of health services through the health authorities. The Ministry of Health Planning is focused on long-term policy and planning. In 2001, the service plans of both ministries established outcome-based targets and strategies to meet the goal of improving patient care and the health of British Columbians. A series of indicators are being monitored to measure progress towards these targets. The concept of establishing targets and indicators first developed through the establishment of health goals is being widely adopted for the management and delivery of health services.

In addition, in 2001, B.C.'s former 52 health authorities were streamlined into five regional health authorities and one provincial health authority. The Provincial Health Services Authority (PHSA) is the umbrella agency responsible for delivering specialized health services such as organ transplants, cancer treatment and pediatric medical care, as well as provincial programs like the B.C. Centre for Disease Control. Performance contracts have been signed with each health authority requiring them to report on how well they are meeting a list of performance targets. Establishing goals and measuring progress by a standard set of indicators will enhance accountability and service quality in B.C.'s health system.

Regional Health Authorities and Health Goal Performance

B.C.'s five regional health authorities are Interior, Fraser, Vancouver/Coastal, Vancouver Island and Northern. Within the five regions are 16 health service delivery areas (HSDA).

Each HSDA population has its unique health challenges. Therefore, where data are available, we present regional differences for each indicator in this report. However, there are several health organizations that are still in the process of mapping their data into the new boundaries. Many non-health indicators are simply not compiled by HSDAs.

TABLE 1.3 HEALTH AUTHORITIES AND THEIR HEALTH SERVICE DELIVERY AREAS

Interior	Fraser	Vancouver Coastal	Vancouver Island	Northern
East Kootenay	Fraser Valley	Richmond	South Vancouver Island	Northwest
Kootenay/Boundary	Simon Fraser	Vancouver	Central Vancouver Island	Northern Interior
Okanagan	South Fraser	North Shore/Coast	North Vancouver Island	Northeast
Thompson/Cariboo		Garibaldi		

From time to time, health authorities approach the Ministry of Health Services to request approval for changes in geographical boundaries to better reflect the changing communities and to make the data collection by region more meaningful for comparison within the health authority. For example, Courtenay local health area is now part of the North Vancouver Island HSDA. Previously, it was part of Central Vancouver Island HSDA. These changes do not always coincide with the reporting cycle of the PHO's annual reports, and can only be incorporated in the next cycle.

NEW *PUBLIC HEALTH ACT* TO INCLUDE "OUTCOME-BASED" CORE PUBLIC HEALTH PROGRAMS

Public health has been defined as the science and art of preventing disease, prolonging life and promoting health through the organized efforts of society. In B.C., consultation and planning are now underway to strengthen and redefine the *Public Health Act* and to include a set of core public health programs that will be available to all British Columbians. The core programs are still being determined through a detailed consultation process, but will fall into three broad categories:

- Health Improvement Programs that advance the health status of the population, such as promoting healthy pregnancies, healthy infant and child development, healthy living conditions and healthy patterns of living.
- Prevention Programs that reduce the incidence of specific diseases, disabilities and injuries such as immunization programs, communicable disease control, and injury prevention.
- Environmental Health Programs that protect people from environmental hazards, ensuring clean air, water, safe food, community sanitation, safe institutions and emergency preparedness.

Essential elements of a core program must include more than just the ability to prevent diseases and control health threats within the mandate of the Ministries of Health Planning and Health Services. These programs must also include reasonable evidence of the program's scientific effectiveness and cost-effectiveness, and have indicators to measure its impact on health. Thus, once again, goals and programs will be linked to a reliable set of indicators to help measure and evaluate progress, not just note actions. Evidence and best practices are being gathered, indicators and information systems developed, and core programs finalized with the goal of having a new *Public Health Act* by spring 2005.

Chapter 2

HEALTH STATUS

How healthy are British Columbians? Monitoring traditional measures of health status can give us a good picture. This chapter reviews twelve indicators frequently used by public health officials to gauge the health of the population. These are summarized into the following categories:

- **Well-being** – self-rated health, positive mental health
- **General health** – functional health, activity limitation, disability days
- **Health conditions** – prevalence of obesity and chronic conditions
- **Deaths** – infant mortality, premature deaths, life expectancy.

HEALTH STATUS

Well-being

Self-rated health – *Not much change*
Positive mental health – *Not much change*

General health and function

Functional health – *Worsening*
Activity limitation – *Worsening*
Disability days – *Not much change*

Health conditions

Overweight – *Not much change*
Chronic conditions – *Worsening*
Chronic pain – *Not much change*
Mental illness – *Worsening*

Deaths

Infant mortality – *Not much change*
Potential years of life lost – *Improving*
Life expectancy – *Improving*

Well-Being

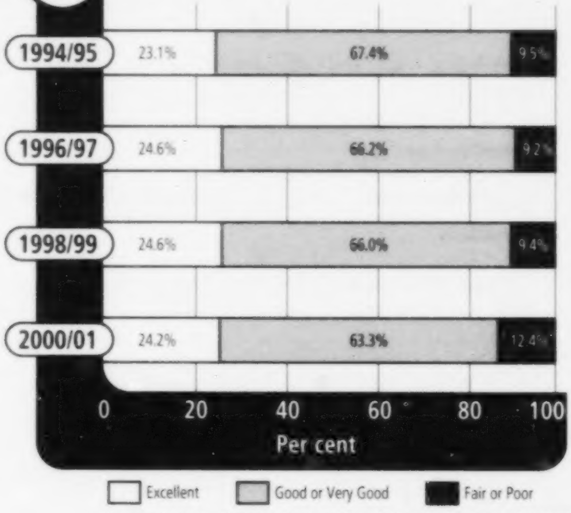
Well-being is health in the positive sense and characterizes how one feels about oneself, one's health and one's life situation. Self-rated health asks individuals to rank their own perception of their health. Feelings of self-esteem, happiness and mastery are other measures used to gauge well-being. These measures are considered "soft" measures as they are subjective and cannot be standardized, nor can they be obtained from administrative databases.

What Do The Data Show?

- As in 1999, most British Columbians continue to report good, very good or excellent health. The likelihood of reporting excellent health continues to be strongly linked with higher levels of education and income.
- Most British Columbians – 75 per cent – continue to say they are happy and interested in life. Three-quarters ranked high or moderate on scores of feelings of mastery and self-esteem, similar to findings in the last report.

FIGURE 2.1

Self-rated health as "excellent", "good or very good" or "fair or poor", Age 12 years and over, B.C., 1994/95 to 2000/01



Source: Statistics Canada. National Population Health Survey 1994/95, 1996/97, 1998/99 and Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 September), http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

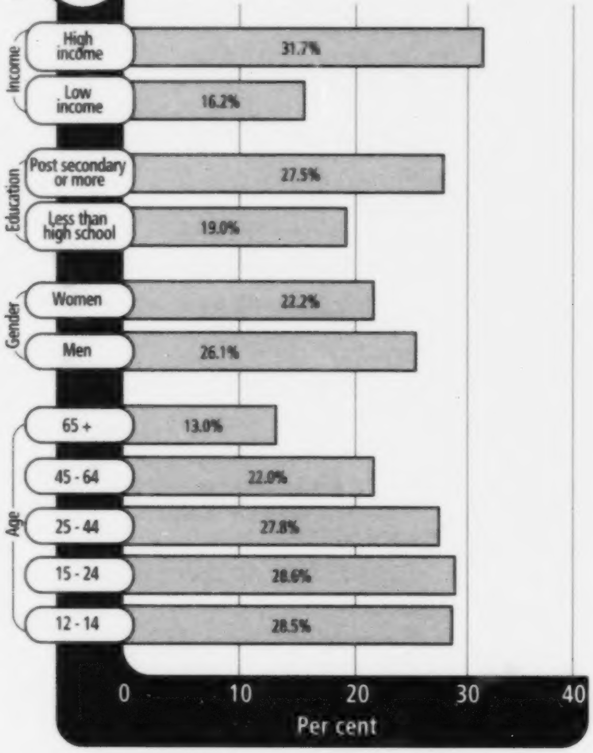
Self-Rated Health

Self-rated health is collected directly through routine surveys of sample populations. In 2000/01 self-rated health was one of the questions in the Canadian Community Health Survey (CCHS), which polled more than 130,000 randomly selected respondents across the country. Comparative data for the previous years from 1994/95 to 1998/99, reported in our 1999 Annual Report, were derived from the National Population Health Survey (NPHS).

A total of 24.2 per cent of British Columbians rate their health as "excellent", similar to the previous years (see Figure 2.1). In fact, rankings have not changed much for almost 20 years. Ratings of "excellent", "very good" or "good" in self-rated health tended to decrease as age increased. By regions, North Shore/Coast Garibaldi Health Service Delivery Area (HSDA) had the highest proportion rating their health as "excellent" (32.0 per cent), while Northern Interior HSDA had the lowest (20.6 per cent) proportion.

FIGURE 2.2

Self-rated health as "excellent" by selected groups, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

The proportion of British Columbians who rated their health as "poor" or "fair" in the NPHS has increased from 9.5 per cent in 1994/95 to 12.4 per cent reported in CCHS 2000/01 survey. This three per cent increase reaches statistical significance (p.005). Results for this indicator should be watched in future years to see whether it is the emergence of a genuine trend.

Women continue to have lower self-rated health than men. Similarly, people with lower levels of education or income are also less likely to rate their health as "excellent" than people with higher educational attainment or incomes (see Figure 2.2).

Positive Mental Health

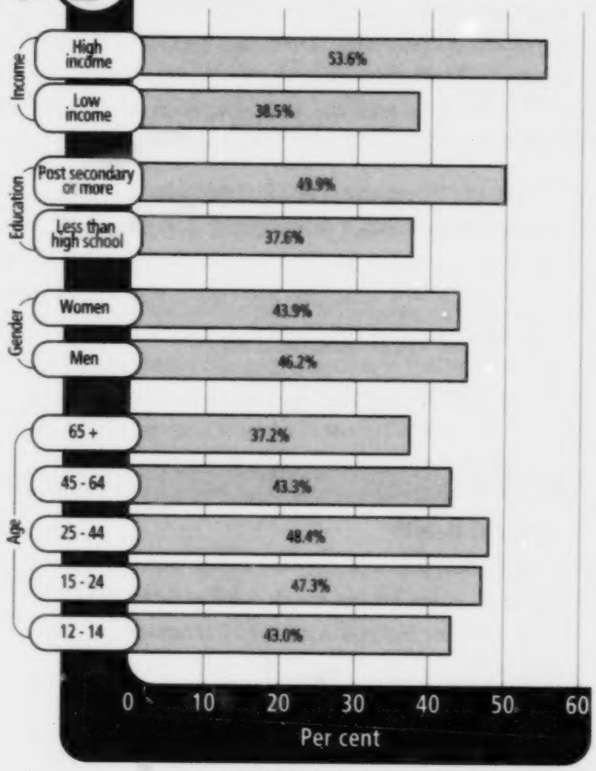
Feelings of happiness, high self-esteem, mastery and coherence are all signs of positive mental health. Provincial data on this measure were collected through numerous questions in the CCHS and have been compared to the NPHS results. Happiness and interest in life are general measures of well-being and quality of life. Self-esteem refers to one's sense of self worth, while mastery measures the extent to which individuals feel their life situation is under their own control. A sense of coherence measures whether the individual feels that life events are comprehensible, manageable and meaningful. Scores for self-esteem, mastery, and sense of coherence are based on scales. Self-esteem, for example, is based on a series of questions with a scale of 25 points with those scoring 20 to 25 considered to have high self-esteem.

Over the last decade, results for positive mental health measures have been consistent. In 2000/01, about three-quarters of British Columbians describe themselves as happy and interested in life and three quarters rank as moderate or high in their feelings of mastery and self-esteem. These scores are unchanged from the 1999 Annual Report.

- The same patterns of positive mental health in relation to socio-economic status reflect those observed in 1999 (see Figure 2.3):
- People with higher income report having more self-esteem than do people of lower income.
- People with a university education are still more likely to have a high ranking for self-esteem than people who have not completed high school.
- As in 1999, women tend to report feeling interested in life slightly more often then men, but men tend to rank in the highest level of self-esteem slightly more often than women.
- Feelings of self-esteem tend to peak at middle age.

FIGURE 2.3

High self-esteem by selected groups, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

? Where do we go from here?

Targets to improve well-being are difficult to set. However, certain sections of the B.C. population (men, people aged 24 to 45, the highly educated) report good, very good or excellent health, higher self-esteem and greater feelings of mastery and coherence. More work needs to be done to find ways to reduce disparities known to be associated with poorer feelings of health and well-being and with greater feelings of dysphoria (mental discomfort or unease).

Well-Being

Well-being is health in the positive sense and characterizes how one feels about oneself, one's health and one's life situation. Self-rated health asks individuals to rank their own perception of their health. Feelings of self-esteem, happiness and mastery are other measures used to gauge well-being. These measures are considered "soft" measures as they are subjective and cannot be standardized, nor can they be obtained from administrative databases.

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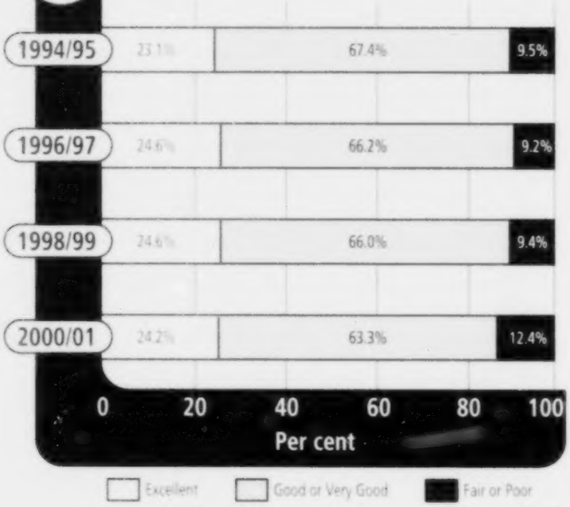

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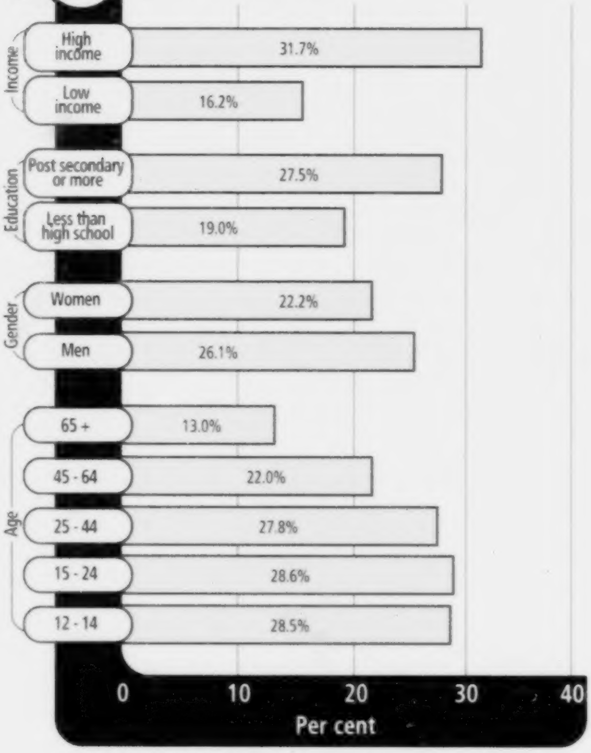
A total of 24.2 per cent of British Columbians rate their health as "excellent", similar to the previous years (see Figure 2.1). In fact, rankings have not changed much for almost 20 years. Ratings of "excellent", "very good" or "good" in self-rated health tended to decrease as age increased. By regions, North Shore/Coast Garibaldi Health Service Delivery Area (HSDA) had the highest proportion rating their health as "excellent" (32.0 per cent), while Northern Interior HSDA had the lowest (20.6 per cent) proportion.

FIGURE 2.2 Self-rated health as "excellent" by selected groups, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

The proportion of British Columbians who rated their health as "poor" or "fair" in the NPHS has increased from 9.5 per cent in 1994/95 to 12.4 per cent reported in CCHS 2000/01 survey. This three per cent increase reaches statistical significance (p.005). Results for this indicator should be watched in future years to see whether it is the emergence of a genuine trend.

Women continue to have lower self-rated health than men. Similarly, people with lower levels of education or income are also less likely to rate their health as "excellent" than people with higher educational attainment or incomes (see Figure 2.2).

Positive Mental Health

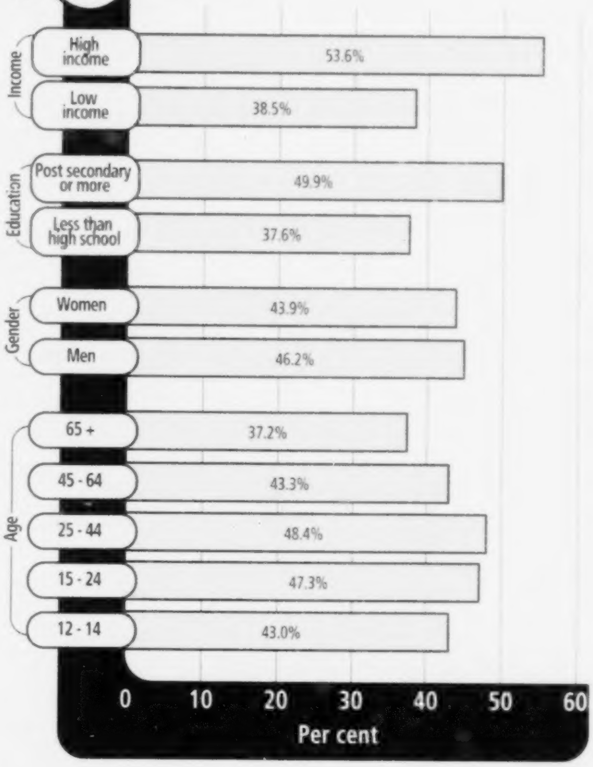
Feelings of happiness, high self-esteem, mastery and coherence are all signs of positive mental health. Provincial data on this measure were collected through numerous questions in the CCHS and have been compared to the NPHS results. Happiness and interest in life are general measures of well-being and quality of life. Self-esteem refers to one's sense of self worth, while mastery measures the extent to which individuals feel their life situation is under their own control. A sense of coherence measures whether the individual feels that life events are comprehensible, manageable and meaningful. Scores for self-esteem, mastery, and sense of coherence are based on scales. Self-esteem, for example, is based on a series of questions with a scale of 25 points with those scoring 20 to 25 considered to have high self-esteem.

Over the last decade, results for positive mental health measures have been consistent. In 2000/01, about three-quarters of British Columbians describe themselves as happy and interested in life and three quarters rank as moderate or high in their feelings of mastery and self-esteem. These scores are unchanged from the 1999 Annual Report.

- The same patterns of positive mental health in relation to socio-economic status reflect those observed in 1999 (see Figure 2.3):
- People with higher income report having more self-esteem than do people of lower income.
- People with a university education are still more likely to have a high ranking for self-esteem than people who have not completed high school.
- As in 1999, women tend to report feeling interested in life slightly more often then men, but men tend to rank in the highest level of self-esteem slightly more often than women.
- Feelings of self-esteem tend to peak at middle age.

FIGURE 2.3

High self-esteem by selected groups, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

? Where do we go from here?

Targets to improve well-being are difficult to set. However, certain sections of the B.C. population (men, people aged 24 to 45, the highly educated) report good, very good or excellent health, higher self-esteem and greater feelings of mastery and coherence. More work needs to be done to find ways to reduce disparities known to be associated with poorer feelings of health and well-being and with greater feelings of dysphoria (mental discomfort or unease).

General Health

General health can be assessed by looking at people's ability to carry out the everyday tasks of living. Functional health, activity limitation and disability days are three indicators available to assess general health status.

What Do The Data Show?

- In 2000/01, 78.9 per cent of British Columbians reported very good functional health, a decline from 85.2 per cent since 1994/95.
- One in four people reported having activity limitations in 2000/01 compared to one in five in 1994/95.
- 18.2 per cent people reported having to stay in bed or cut down on activities because of illness or injury in the two weeks preceding the survey, slightly greater than in 1994/95.

Functional Health

Functional health is measured by nine dimensions of physical functioning – vision, hearing, speech, mobility, dexterity, feelings, cognition, memory and pain. A score of 1.0 is considered perfect health, between 0.8 and 1.0 is very good health with any problems easily corrected (for example, use of corrective eyeglasses). Scores below 0.8 are considered to indicate moderate to severe functional health problems.

Compared to NPHS data from 1994/95 and 1996/97, the CCHS found a lower proportion of the B.C. population in 2000/01 reporting "very good" or "perfect" functional health: 78.9 per cent in 2000/01 compared to 85.2 in 94/95 (see Figure 2.4).

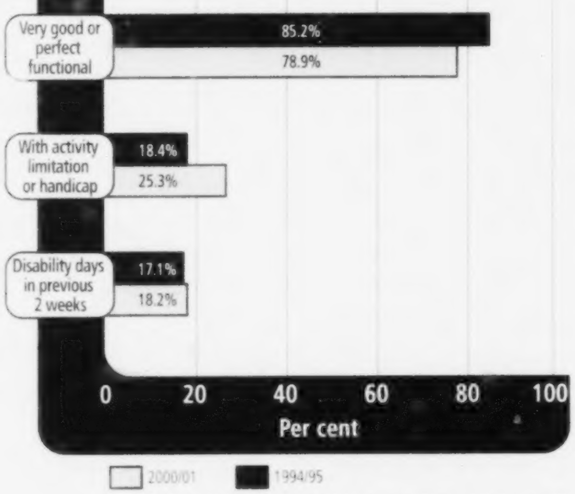
Activity Limitation

Activity limitation is measured by the number of people who report having a disability or being unable to perform certain activities for at least six months or more because of a physical condition, mental condition, or health problem. In 2000/01, 25.3 per cent of those polled said they had an activity limitation, up from 18.4 per cent in 1994/95.

Two-Week Disability Days

Both the NPHS and the CCHS asked respondents whether they had to stay in bed or cut down on normal activities because of illness or injury on one or more days in the past two weeks. The results for 2000/01 were very similar to 1994/95, with 18.2 per cent compared to 17.1 per cent saying they had experienced illness or injury in the two weeks previous to the survey. This number is better than the Canadian average of 22.9 per cent.

FIGURE 2.4 General health indicators, Age 12 years and over, B.C., 1994/95 and 2000/01



Source: Statistics Canada. National Population Health Survey 1994/95, and Canadian Community Health Survey 2000/01.
Prepared using CANSIM II (2002 October).
http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

The data for these three indicators appear to show that while a slightly smaller proportion of British Columbians are in good functional health, the majority nonetheless continue to maintain their normal daily activities. This finding is confirmed by a study, using data from the 1996 General Social Survey Study and the 1991 Health and Activity Limitation Survey, showing that many care receivers continue to work despite a chronic health problem (Cranswick, 1999). These are individuals who received help with daily chores from another person or organization because of a long-term health problem or physical limitation lasting more than six months. This national study reported that one out of every four care-receivers of working age continued to put in a full work week. They worked an average of 38 hours per week, only slightly lower than the average employee, who typically worked 42 hours per week.

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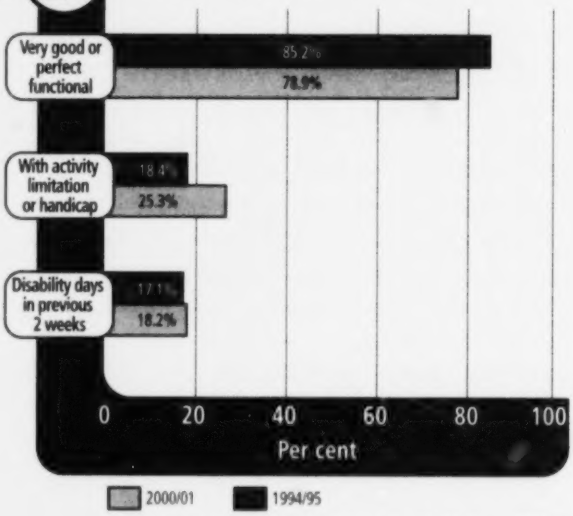

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Where Do We Go From Here?

Poor functional health and limitations on daily activity can be a result of a wide range of health problems, such as back problems, heart conditions, mental illness, and vision and hearing impairment. Advancing age is highly correlated to declining functional health and increased activity limitation. However, some conditions that lead to poorer functional health, activity limitation and disability days are preventable. Back problems are a common cause of activity limitation or missed days of work and many can be prevented with attention to proper lifting and regular exercise.

Injuries are often deemed random accidents by the general public, but as the Canadian Public Health Association (CPHA) notes in a recent position paper, most injuries are the result of preventable factors that follow predictable patterns associated with age, gender, injury mechanism, social characteristics and geography (CPHA, 2002). These predictable patterns point to the potential for public health campaigns to target prevention and control measures to specific groups to reduce the toll of injuries. Other common causes of a decline in functional health, activity limitations and days off work can be reduced by improved diet and exercise. These issues will be discussed in more detail under Goal 6 on Disease and Injury Prevention.

Health Conditions

The rates at which specific diseases or conditions occur in the population help identify trends and patterns in illness or health problems and also help determine the need for prevention, treatment and support services.

This section reports on a few of the specific conditions and diseases that impact health and quality of life: being overweight, having a chronic disease such as arthritis or diabetes and experiencing chronic pain or a chronic mental health problem. Mortality due to heart disease, cancer, injuries, and other major diseases are discussed under Goal 6 on Disease and Injury Prevention.

What Do The Data Show?

- The rate of obesity in B.C. adults has remained at a relatively constant rate since 1999. Many British Columbians have or will have health problems related to their excess weight. In children, the rate of obesity has more than doubled over the last two decades. This is a cause for alarm because of the potential health impacts this trend may bring in the future.
- In general, the prevalence of chronic conditions has increased. Rates of diabetes and asthma are of a particular concern because of the burden of illness and impact on individuals' lives.
- Chronic pain is a significant problem for one in six people in B.C., a number that has remained relatively unchanged since 1999.
- Mental illness is exacting a huge toll on the lives of those it affects. Compared to the general population, individuals with psychiatric illness are much more likely to die of both natural and external causes. Some of this excess mortality is likely due to inadequate medical care for treatable conditions. The proportion of the population with probable or possible risk of depression is worsening – 9.1 per cent in 1994/95, which dropped to less than 7.0 per cent in 1996/97 and 1998/99, but increased to 11.6 per cent in 2000/01.

Obesity

Obesity is a serious health problem in B.C., and in most nations around the world. In fact, according to the World Health Organization (WHO), obesity is now so common that it is replacing the more traditional public health concerns such as under-nutrition and infectious disease as one of the most significant contributors to ill health worldwide (WHO, 1997). Carrying excess weight is strongly related to numerous health problems, including higher rates of cardiovascular disease, diabetes, gastrointestinal illness, arthritis and many cancers.

One of the most common, although imperfect, method to calculate whether an individual is overweight or obese is to use the Body Mass Index (BMI). It is considered an imperfect measure because it can misclassify individuals, such as labeling athletic individuals who have a higher weight from muscle as overweight. It is also not accurate for children or for very tall or very short people and becomes less accurate as people age. More precise measures of obesity would be obtained if waist circumference or waist-to-hip ratios were also measured, both of which give an indication of how much excess weight individuals are carrying around their abdomens. A round "apple" shape poses the highest risk for adverse health effects. Despite its weaknesses, however, BMI is the simplest and most standardized way to collect an estimate on the prevalence of obesity in the population.

BMI is calculated by dividing weight in kilograms by height in meters squared. The resulting number will generally lie somewhere on a scale between 15 and 40. In the 1980s and 1990s, it was generally considered that a BMI of 25 to 26.9 denoted some excess weight, 27 to 29.9 was considered overweight and a BMI of 30 to 40 was obese. An expert committee convened by the WHO recommended in the mid-1990s that the BMI scale be altered downward so that anyone with a BMI of 25 to 29.9 is considered overweight, and 30 or more obese or severely obese (WHO, 1995). In part, this change was recommended because more evidence was emerging of the negative health effects of excess weight from a BMI of 25 or greater.

BODY MASS INDEX

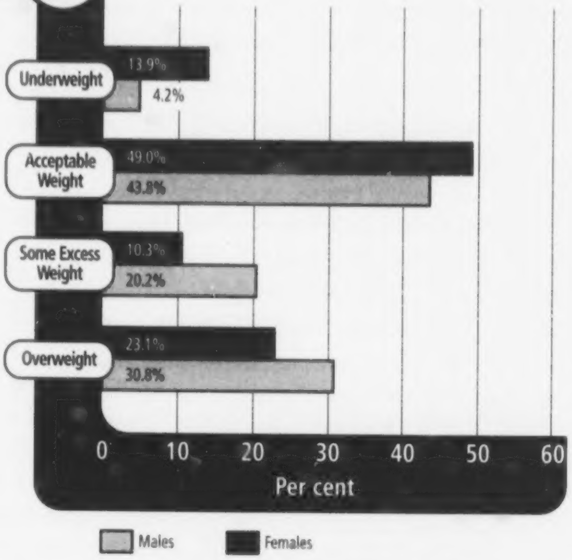
	Old	New
Underweight	<20	<18.5
Normal	20-24.9	18.5-24.9
Some excess weight	25.0-26.9	N/A
Overweight	27.0-29.9	25-29.9
Obese	30-40+	30-40+

Over the last few years various organizations such as the U.S. Center for Disease Control, the National Institutes of Health, and Health Canada have adopted this new ranking. In choosing nationally comparable indicators, the Canadian Institute of Health Information, Statistics Canada and the provinces selected a BMI of 25 or greater as being overweight. Using this number, the B.C. Ministry of Health Planning reported in September 2002 that more than 40 per cent of British Columbians are overweight. These are based on self-reported heights and weights collected through the CCHS and NPHS. Numerous studies have also shown that people tend to understate their weight, leading to underestimation of the prevalence of obesity. The 1999 BC Nutrition Survey used nurses to measure subjects' heights and weights and found 55 per cent were overweight or obese with a BMI of 25 or greater. This is notably higher than the self-reported figure of 40 per cent.

For the 1999 Annual Report, a BMI of 27 or greater was categorized as overweight or obese. Using this ranking in 2000/01, CCHS statistics indicate that 27.0 per cent of the adult B.C. population, age 20 to 64, can be classified as overweight and 15.3 per cent carry some excess weight. It is important to note that data for this finding is the same as that used by the B.C. Ministry of Health Planning which found that 40 per cent of the province's population is overweight. The only difference is that people were grouped in slightly different categories. These numbers remain relatively unchanged over the last decade. Using the 27 or greater BMI, more men (30.8 per cent) than women (23.1 per cent) are overweight (see Figure 2.5).

FIGURE 2.5

Body weight, Age 20-64 years, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 October), http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

The highest proportion of overweight people is found in the Northwest (40.7 per cent) and the lowest is in Vancouver (14.5 per cent) HSDA. In future reports, the Provincial Health Officer will use a BMI of 25 or greater to indicate those overweight or obese.

Epidemic of Obesity in Children

An alarming trend over the last two decades is the progressive increase in excess weight and obesity among Canadian children. From 1981 to 1996, the prevalence of overweight increased by 92 per cent in boys and by 57 per cent in girls. The prevalence of obesity has more than doubled in both sexes (Tremblay & Willms, 2000).

According to findings of the National Longitudinal Survey of Children and Youth (NLSCY), one-third of Canadian children (age 2 to 11) were overweight in 1998/99 and 56 per cent were overweight for at least one year during the period 1994/95 to 1998/99 (Statistics Canada, *The Daily*, October 18, 2002). Ten per cent were consistently overweight over the four-year period.

These findings are of concern because of the impact of increasing levels of obesity on the health and wellness of individuals and the population at large due to the potential increase in the prevalence of certain illnesses and chronic diseases. An internal analysis conducted by the B.C. Ministry of Health Planning using a combination of data found that the population-attributable risk of diabetes due to excess weight is 48 per cent (Population Health Surveillance and Epidemiology, 2002). This is based on data from the CCHS 2000/01 and study on *The Cost of Obesity in Canada* (Birmingham et al., 1999 February).

The WHO concludes that the fundamental causes of the obesity epidemic are sedentary lifestyles and high-fat, energy-dense diets. The WHO notes that people who sustain moderately high levels of physical activity throughout life may be able to tolerate higher-fat and higher-calorie diets, but the widespread decline in physical activity in most societies combined with higher-fat and higher-calorie diets are associated with rapidly rising rates of obesity and steadily rising rates of medical complications from obesity. The findings from indicators for diet, nutrition and exercise are discussed in more detail in Goal 2, under the section on Healthy Choices. Results generally show that many B.C. individuals are not eating a healthy diet or getting enough exercise.

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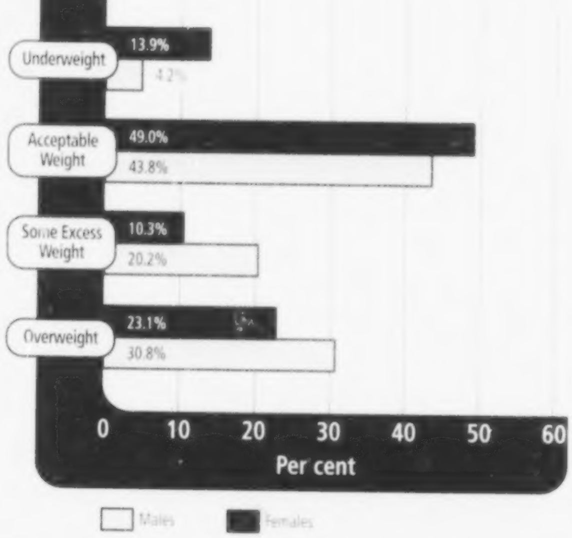

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In addition to physical activity programs, we need to start a serious conversation about how our children live and play, and the food choices they and their families make.

Chronic Conditions

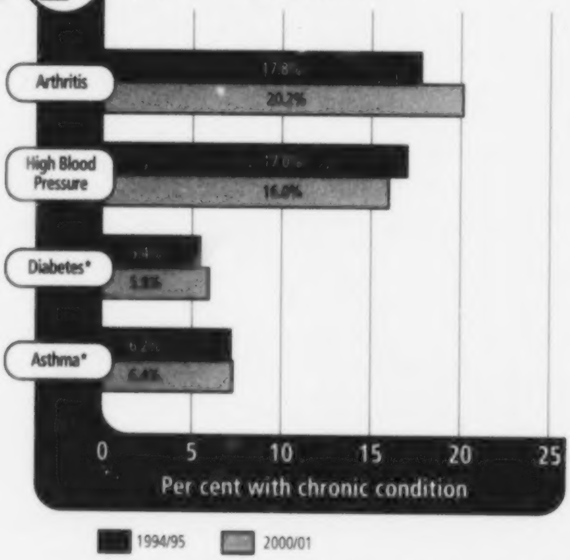
In 2000/01, a higher proportion of individuals (12 years and over) were diagnosed with chronic conditions compared to 1994/95. This increasing trend was seen particularly in conditions such as diabetes, arthritis, high blood pressure and asthma.

Although chronic conditions can occur at any age, they are more common among older age groups. Over the period 1994/95 to 2000/01, a lower proportion of British Columbians, age 45 to 64, reported being diagnosed by their physicians with high blood pressure. Slightly more reported a diagnosis of diabetes or arthritis/rheumatism. (See Figure 2.6.) These increases are not considered statistically significant.

Chronic conditions not only place limitations on daily activities, they can also reduce the number of disability-free years and add to the global burden of disease in British Columbia. The burden of chronic conditions and how it translates into years of life lost and years lost due to disability is discussed in more detail in Goal 6.

FIGURE 2.6

Chronic conditions, Age 45-64 years, B.C., 1994/95 and 2000/01



Note: * Data for 1994/95 should be read with caution because of small sample size. 2000/01 diabetes data include females 15 and over diagnosed with gestational diabetes.
Source: Statistics Canada. National Population Health Survey 1994/95 and Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 December),
http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

The prevalence of diabetes is a particular concern. According to a report from the provincial Diabetes Working Group for the B.C. Ministry of Health Planning, each year about 19,000 British Columbians are newly diagnosed with diabetes. The vast majority of them have Type 2, which typically starts in late middle age, and is largely associated with obesity and a lack of exercise. Uncontrolled diabetes can cause severe complications, including blindness, renal failure, limb amputation, stroke and heart attack and can ultimately lead to death. In 2000/01, more than $663 million was spent in B.C. on hospitals, doctors, drugs, and renal services for the care of people with diabetes. Those costs represent about 14.4 per cent of the hospitals, doctors and PharmaCare budget and cover about 175,000 (4.3 per cent) people in the province. With the increasing rates of diagnosis and aging of the population, those costs are projected to double by 2010 if proactive measures are not widely introduced (Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning, 2003). The Aboriginal population of B.C. has a diabetes rate that is 3.2 times greater than the general population.

Programs which focus on healthy diet and exercise can help prevent new cases of diabetes from occurring. The complications of diabetes, once diagnosed, can be reduced if patients, in partnership with their doctors, learn how to strictly control their blood sugar through diet, medication and exercise and have regular testing to detect the early signs of trouble before major complications arise.

The emerging focus on chronic disease management (CDM) is an important trend that needs to be supported and should improve patient health and lessen the impact of diabetic complications. CDM has four essential features: patient registries so doctors can track and recall their chronic disease patients for preventive tests and treatments; strict adherence to treatment protocols so patients are sure to get the most beneficial care; multidisciplinary teams so patients have easy access to a range of expertise including dieticians and therapists; and resources for patient education and self-management that give patients the tools and information they need to better manage their disease.

Asthma affects only six per cent of adults and 12 per cent of children. It is one of the more prevalent chronic conditions in B.C. and Canada. It seriously undermines the quality of life of affected individuals and contributes to increased burden on health care services. Asthma mortality rates increased significantly during the 1970s and 80s. By the mid-1990s, the mortality rates began to drop, due in part to efforts of the National Task Force on Asthma and the Canadian Asthma Consensus Group, which focused on better pharmaceutical management and control of asthma (Health Canada, 1999, Boulet et al., 1999). Although there is a strong genetic component to asthma, environmental factors such as air pollution, climate, and exposure to tobacco smoke and occupational irritants have been associated with increased risk of asthma. In the last decade, research has also found a link between too-clean environments and higher rates of asthma, raising the theory that insufficient exposure to dirt and common infectious agents in childhood may be contributing to children's altered immune response in asthma (Strachan, 2000, Sherriff et al., 2002). Further research is needed to better understand these environmental influences to help guide clinical management and potentially direct public health intervention.

Chronic Pain

According to the 2000/01 CCHS, 17 per cent of British Columbians suffer from chronic pain and discomfort. This is a slight increase – one per cent – from the last reported data in 1994/95 and 1996/97 and is not statistically significant.

Chronic pain increases with age and more B.C. women have reported being "not free from chronic pain or discomfort" than B.C. men (see Figure 2.7). People with more education are less likely to report chronic pain and discomfort than those with lower levels of education. As we reported in 1999, most people reporting pain describe it as mild or moderate. Some who report chronic pain, particularly men, may still describe their self-rated health status as good or excellent – which explains why more people report chronic pain (17 per cent) than say their health is fair or poor (12.4 per cent).

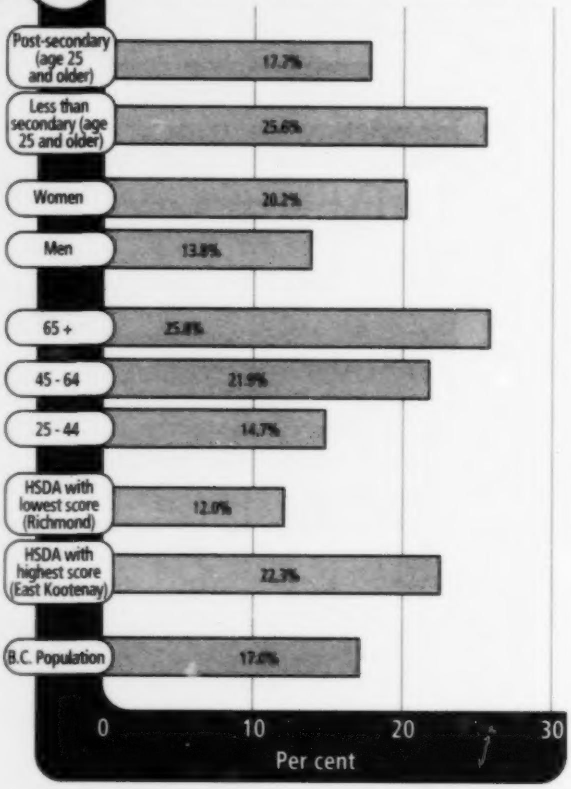
There are some regional differences, with Richmond (12.0 per cent) having the lowest proportion of respondents who report experiencing chronic pain or discomfort. East Kootenay ranked highest for this indicator, with 22.3 per cent reporting chronic pain.

Mental Illness

Mental illness is one of the largest contributors to disability and ill health, contributing more than 10 per cent of the total burden of human disease (the combined loss of life and disability) based on World Health Organization assessment. The onset of most mental health disorders occurs during adolescence and young adulthood, and can affect people of all ages, educational and income levels, and cultures.

FIGURE 2.7

Selected groups who reported "not usually free of pain and discomfort", B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

About one in five British Columbians will experience a mental illness during any given year. Many more people will experience mental health problems that warrant attention but do not meet the diagnostic criteria as a mental illness.

Mental illness exacts a huge toll on the health and well-being of those it affects as well as their families. Numerous studies have consistently shown that psychiatric patients of all age groups have higher mortality rates than the general population, not only from suicide, homicide and injuries, but from natural causes too. People with mental illness are at higher risk of concomitant medical illness than the general population. An analysis of B.C. mortality data from April 1997 to December 2000 has shown that people who were hospitalized with a psychiatric diagnosis in 1996/97 had a much higher overall morality rate than the general population

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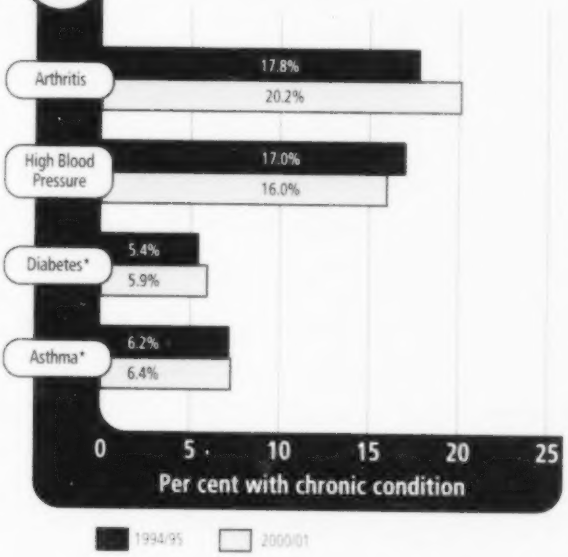
Chronic conditions not only place limitations on daily activities, they can also reduce the number of disability-free years and add to the global burden of disease in British Columbia. The burden of chronic conditions and how it translates into years of life lost and years lost due to disability is discussed in more detail in Goal 6.

FIGURE 2.6 Chronic conditions, Age 45-64 years, B.C., 1994/95 and 2000/01



Note: * Data for 1994/95 should be read with caution because of small sample size. 2000/01 diabetes data include females 15 and over diagnosed with gestational diabetes.
Source: Statistics Canada. National Population Health Survey 1994/95 and Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 December),
http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

The prevalence of diabetes is a particular concern. According to a report from the provincial Diabetes Working Group for the B.C. Ministry of Health Planning, each year about 19,000 British Columbians are newly diagnosed with diabetes. The vast majority of them have Type 2, which typically starts in late middle age, and is largely associated with obesity and a lack of exercise. Uncontrolled diabetes can cause severe complications, including blindness, renal failure, limb amputation, stroke and heart attack and can ultimately lead to death. In 2000/01, more than $663 million was spent in B.C. on hospitals, doctors, drugs, and renal services for the care of people with diabetes. Those costs represent about 14.4 per cent of the hospitals, doctors and PharmaCare budget and cover about 175,000 (4.3 per cent) people in the province. With the increasing rates of diagnosis and aging of the population, those costs are projected to double by 2010 if proactive measures are not widely introduced (Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning, 2003). The Aboriginal population of B.C. has a diabetes rate that is 3.2 times greater than the general population.

Programs which focus on healthy diet and exercise can help prevent new cases of diabetes from occurring. The complications of diabetes, once diagnosed, can be reduced if patients, in partnership with their doctors, learn how to strictly control their blood sugar through diet, medication and exercise and have regular testing to detect the early signs of trouble before major complications arise.

The emerging focus on chronic disease management (CDM) is an important trend that needs to be supported and should improve patient health and lessen the impact of diabetic complications. CDM has four essential features: patient registries so doctors can track and recall their chronic disease patients for preventive tests and treatments; strict adherence to treatment protocols so patients are sure to get the most beneficial care; multidisciplinary teams so patients have easy access to a range of expertise including dieticians and therapists; and resources for patient education and self-management that give patients the tools and information they need to better manage their disease.

Asthma affects only six per cent of adults and 12 per cent of children. It is one of the more prevalent chronic conditions in B.C. and Canada. It seriously undermines the quality of life of affected individuals and contributes to increased burden on health care services. Asthma mortality rates increased significantly during the 1970s and 80s. By the mid-1990s, the mortality rates began to drop, due in part to efforts of the National Task Force on Asthma and the Canadian Asthma Consensus Group, which focused on better pharmaceutical management and control of asthma (Health Canada, 1999, Boulet et al., 1999). Although there is a strong genetic component to asthma, environmental factors such as air pollution, climate, and exposure to tobacco smoke and occupational irritants have been associated with increased risk of asthma. In the last decade, research has also found a link between too-clean environments and higher rates of asthma, raising the theory that insufficient exposure to dirt and common infectious agents in childhood may be contributing to children's altered immune response in asthma (Strachan, 2000, Sherriff et al., 2002). Further research is needed to better understand these environmental influences to help guide clinical management and potentially direct public health intervention.

Chronic Pain

According to the 2000/01 CCHS, 17 per cent of British Columbians suffer from chronic pain and discomfort. This is a slight increase – one per cent – from the last reported data in 1994/95 and 1996/97 and is not statistically significant.

Chronic pain increases with age and more B.C. women have reported being "not free from chronic pain or discomfort" than B.C. men (see Figure 2.7). People with more education are less likely to report chronic pain and discomfort than those with lower levels of education. As we reported in 1999, most people reporting pain describe it as mild or moderate. Some who report chronic pain, particularly men, may still describe their self-rated health status as good or excellent – which explains why more people report chronic pain (17 per cent) than say their health is fair or poor (12.4 per cent).

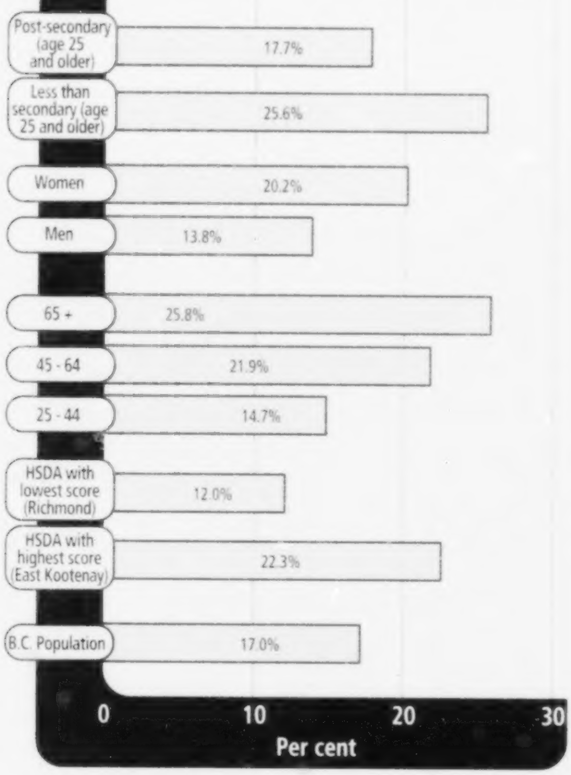
There are some regional differences, with Richmond (12.0 per cent) having the lowest proportion of respondents who report experiencing chronic pain or discomfort. East Kootenay ranked highest for this indicator, with 22.3 per cent reporting chronic pain.

Mental Illness

Mental illness is one of the largest contributors to disability and ill health, contributing more than 10 per cent of the total burden of human disease (the combined loss of life and disability) based on World Health Organization assessment. The onset of most mental health disorders occurs during adolescence and young adulthood, and can affect people of all ages, educational and income levels, and cultures.

FIGURE 2.7

Selected groups who reported "not usually free of pain and discomfort", B.C., 2000/01

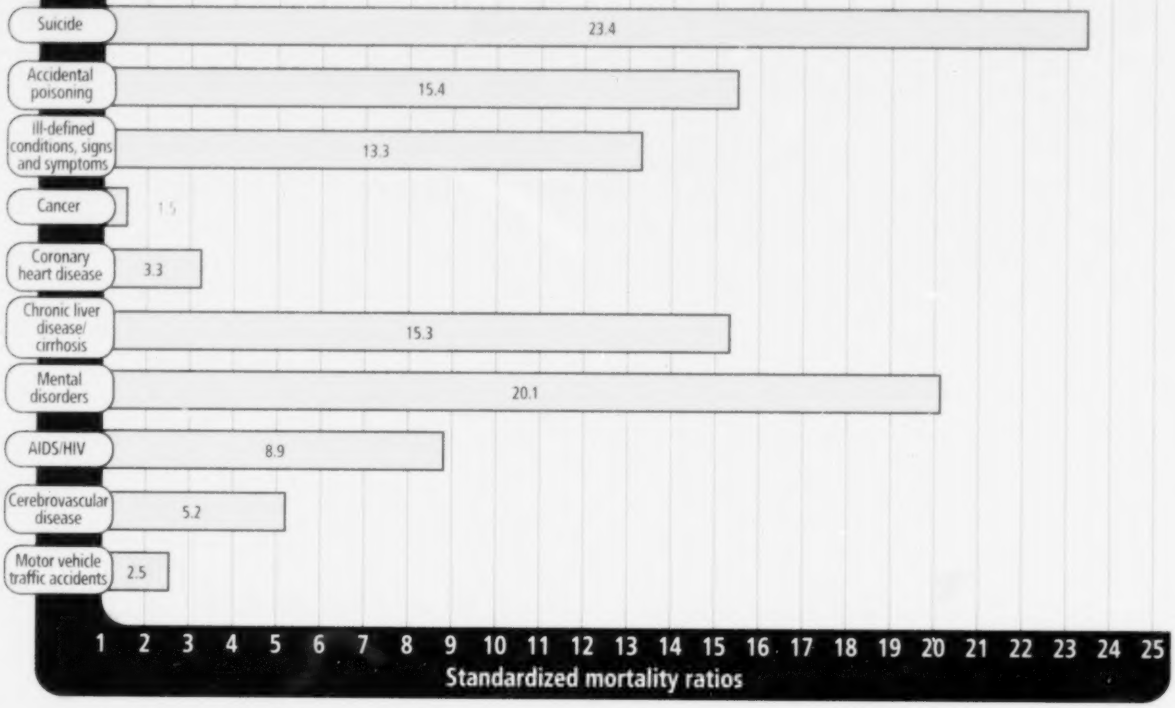


Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services

About one in five British Columbians will experience a mental illness during any given year. Many more people will experience mental health problems that warrant attention but do not meet the diagnostic criteria as a mental illness.

Mental illness exacts a huge toll on the health and well-being of those it affects as well as their families. Numerous studies have consistently shown that psychiatric patients of all age groups have higher mortality rates than the general population, not only from suicide, homicide and injuries, but from natural causes too. People with mental illness are at higher risk of concomitant medical illness than the general population. An analysis of B.C. mortality data from April 1997 to December 2000 has shown that people who were hospitalized with a psychiatric diagnosis in 1996/97 had a much higher overall morality rate than the general population

FIGURE 2.8 Leading causes of death, Standardized mortality ratios, Psychiatric cohort, B.C., April 1997 to December 2000



Source: Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning. Prepared using data from B.C. Vital Statistics Agency and BC STATS

(Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning, 2001). Those with psychiatric illness are three times more likely than the general population to die from coronary heart disease, five times more likely to die of cerebrovascular disease or stroke, nine times more likely to die of AIDS, 13 times more likely to die from ill-defined medical conditions, 15 times more likely to die of chronic liver disease or cirrhosis, and 23 times more likely to die of suicide (see Figure 2.8).

Experts who have studied this phenomenon note the reasons for the higher mortality from all causes can, in part, be attributed to psychiatric illness itself, which makes individuals less likely to notice or respond to health problems and less likely to keep appointments or comply with medical treatment. Frequently the patient may lack the skills and resources to use the health system appropriately (Felker et al., 1996). Psychiatric patients often have unhealthy lifestyles, such as addictions to cigarettes, alcohol or drugs, that place them at higher risk of illness. However, the excess mortality can also be attributed to less-than-optimal medical care, particularly inadequate physician assessment and follow-up (Felker et al., 1996). More attention must be paid to the medical management of psychiatric patients to help address this excess mortality and to bring their mortality rates in line with those of the general population.

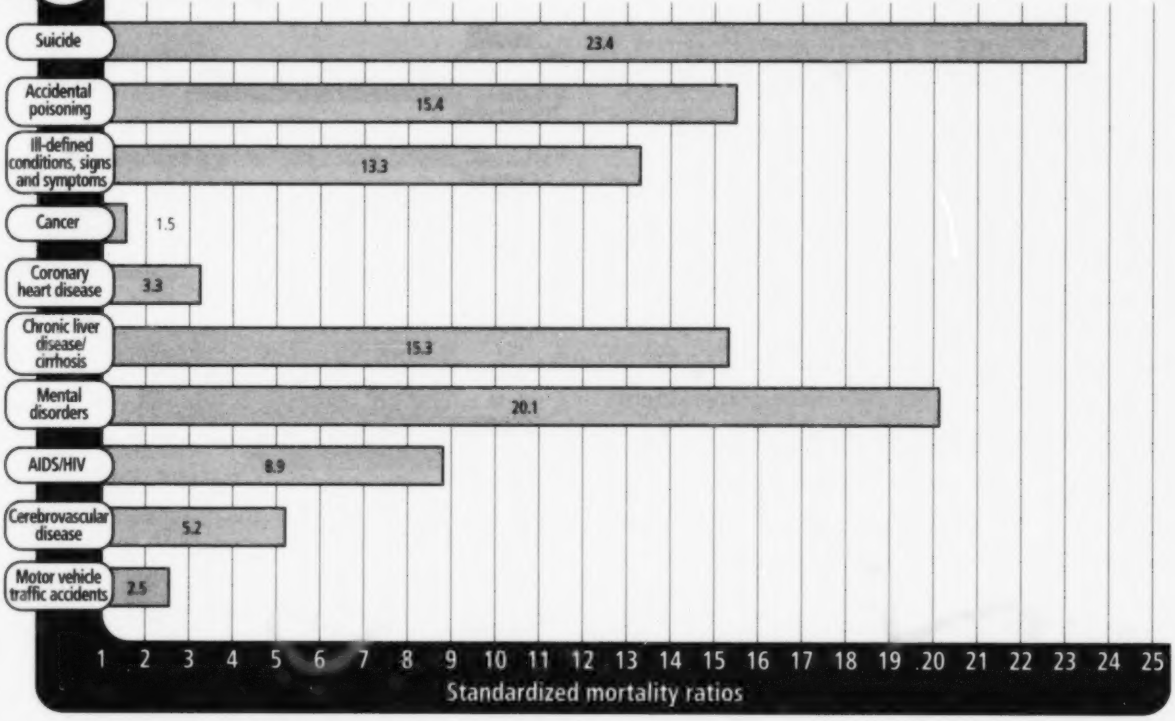
B.C. Trends For Mental Illness

There are several indicators that we can use to measure the magnitude of mental health problems experienced by a population. Depression is one indicator, and in this area the trend appears to be worsening in British Columbia. According to the NPHS/CCHS, the proportion of the population with probable or possible risk of depression was 9.1 per cent in 1994/95, dropped to less than 7.0 per cent in 1996/97 and 1998/99, and increased to 11.6 per cent in 2000/01.

According to British Columbia's Provincial Depression Strategy, Phase I Report, each year one in 25 British Columbians will have a depressive illness, with women affected twice as often as men. Depression and stress disorders at work account for more than 30 per

FIGURE 2.8

Leading causes of death, Standardized mortality ratios, Psychiatric cohort, B.C., April 1997 to December 2000



Source: Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning. Prepared using data from B.C. Vital Statistics Agency and BC STATS.

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TABLE 2.1 MEASURED MENTAL DISORDERS OR SUBSTANCE DEPENDENCE IN THE PAST 12 MONTHS, CANADA, 2002

Disorder	Total	Male	Female
Major depression	4.5	3.4	5.5
Mania disorder	0.8	0.7	0.8
Any mood	**4.9**	**3.8**	**5.9**
Panic disorder	1.6	1.1	2.1
Agoraphobia	0.7	0.4	1.1
Social anxiety	3.0	2.6	3.4
Any anxiety	**4.7**	**3.6**	**5.8**
Alcohol dependence	2.6	3.8	1.3
Illicit drugs dependence	0.7	1.0	0.4
Substance dependence	**3.0**	**4.4**	**1.6**
Total – any measured disorder or substance dependence	**10.4**	**9.7**	**11.1**

Source: Statistics Canada. Canadian Community Health Survey, Cycle 2. (May to December 2002).

cent of all disability recorded at major Canadian corporations and represent the fastest growing category of disability claims (B.C. Ministry of Health Services, 2002). Likewise, anxiety disorders are now estimated to affect one in every 10 B.C. adults, with 39,000 British Columbians severely disabled by this condition. Frequently, however, anxiety disorders go undiagnosed and untreated (Provincial Strategy Advisory Committee for Anxiety Disorders, 2002).

Recently released data from the second cycle of the CCHS showed that slightly more than 10 per cent of Canadians interviewed had experienced a mental disorder or substance dependence in the past 12 months (Statistics Canada, *The Daily*, September 3, 2003). Table 2.1 illustrates the prevalence rates at the national level and we believe they are relatively reliable as an estimate of B.C.'s experience.

The stigma associated with mental illness can lead to under-reporting. Many types of mental illness are also often misunderstood or perceived as part of the normal life stress. Therefore, they are often under-diagnosed or under-treated. Both the Provincial Depression Strategy and Provincial Anxiety Disorders Strategy are province-wide initiatives to develop frameworks and produce recommendations to prevent and treat these two common forms of mental illness. More research and support is needed for those with chronic schizophrenia, which is a devastating illness, that often marginalizes its sufferers.

It is increasingly clear that those with mental illness and their families need improved access to information and services, improved appropriate care, chronic disease self-management tools, and improved outcomes.

Where Do We Go From Here?

Health conditions such as obesity, chronic conditions, pain and mental illness are a continuing concern. Although British Columbia continues to lead the country in the proportion of people with acceptable weight, there is a disturbing trend of increasing overweight and obesity among Canadian children. If it is not reversed, there will be serious consequences for future health. We should target particular groups like adults between the ages of 45 to 64, where twice as many are found to have excess weight or were definitely overweight compared to younger adults. Overweight adults put themselves at higher risk for high blood pressure, diabetes, heart disease and certain types of cancer. The increasing rate of obesity in children is a worrisome trend and children should form another target group. In both groups, increased physical activity and healthy eating patterns should be encouraged.

The provincial government is developing a Chronic Disease Prevention Strategy to complement its Chronic Disease Management Strategy. The former will focus on tobacco prevention, healthy diets, and physical activity in the context of the broader, psycho-social and environmental determinants of health. These measures, with a focus on reducing stress, preventing childhood trauma and increasing social supports, should also help to decrease the occurrence of mental illnesses such as anxiety and depression.

As we noted in the 1999 Annual Report, individuals and families must be encouraged to take action to do what they can to improve or safeguard their own health, such as eating a healthy diet and making physical activity a part of everyday life.

Government, too, can do more to improve the health of the population by:

- Placing higher importance on coordinated and comprehensive strategies to encourage healthy eating and physical activity and on developing methods to evaluate these strategies.
- Working with non-governmental organizations and the private sector to develop a society-wide effort to prevent chronic disease.
- Leading by example by allocating space in the government offices for employees to exercise during lunch breaks or out-of-work hours and setting up workshops on ways to reduce stress.
- Encouraging wider uptake of chronic disease management strategies to improve quality of life of people with chronic conditions and to reduce complications. In addition, government should further support research that adds to scientific knowledge of chronic conditions, their causes and treatment.
- Gathering and analyzing data to better define the trends in mental illness in British Columbia and to determine how well health and social services are meeting the health needs of men and women with mental illness. Gender-appropriate strategies should be developed and implemented to reduce the excess mortality from medically treatable conditions among the mentally ill population.

Deaths

The following three indicators – infant mortality, potential years of life lost and life expectancy – have long been used as standardized indicators of population health and health status.

What Do The Data Show?

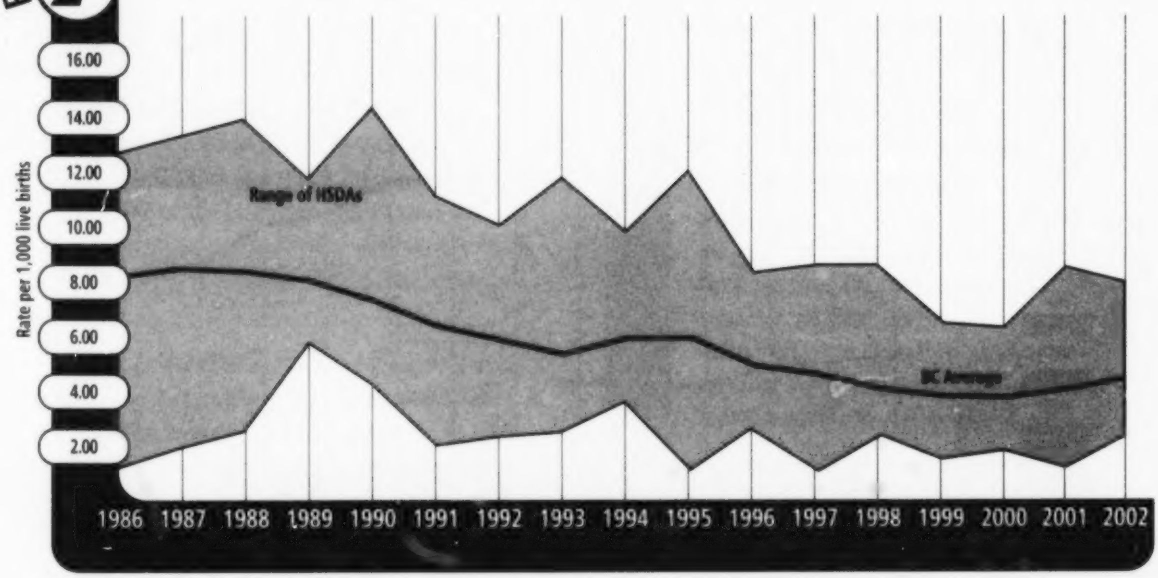
- Infant mortality has been on a downward trend for several decades, but from year to year there can be fluctuations within that trend. Between 1999 and 2002 the infant mortality rate rose from 3.8 to 4.4 per 1,000 live births. This is not statistically significant but is still a cause for concern and attention. B.C.'s rate is still consistently below the Canadian average and among the lowest in the world.
- Premature deaths continue to follow a downward trend, with proportionally fewer people dying each year before age 75. There is still room for improvement, however, since a substantial proportion of premature deaths are due to motor vehicle crashes (3.1 per cent) and lung (and trachea) cancer (10.7 per cent). Many of these deaths could be prevented through a reduction in hazardous or impaired driving and reduction in tobacco use.
- Life expectancy for males has increased by 0.8 years since the 1999 Annual Report, slightly closing the gap between women and men. Life expectancy in B.C. continues to be slightly higher than the Canadian average.

Infant Mortality

Infant mortality is defined as the number of infants who die in the first year of life, expressed as a rate per 1,000 live births for a given year. It is considered a general indicator of the health of a society because the rate is related to the underlying health of the mother, public health practices, socio-economic conditions and availability and use of appropriate health care by pregnant women and their children.

The B.C. Vital Statistics Agency reports 177 infant deaths in 2002, 15 more than in 2001, to produce an infant mortality rate of 4.4 per 1,000. The result is an increase in the provincial infant mortality rate, up from 3.8 per 1,000 in 1999. However, this is not a statistically significant increase. In the 1960s, the infant mortality rate was 20.0 per 1,000 dropping to 8.0 per 1,000 by the mid 1980s and to less than 4.0 per 1,000 by the end of the 1990s.

FIGURE 2.9 **Infant mortality rate, B.C., 1986 to 2002**



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

The major causes of infant mortality continue to be low birth weights, multiple gestations, premature birth, congenital abnormalities and Sudden Infant Death Syndrome (SIDS). While it is often assumed that a higher rate of infant mortality implies a lack of access to adequate medical care, some of the increase in fact could be attributed to increased access to medical care. For example, infertility treatment that creates multiple gestations can lead to multiple births of low birthweight premature infants who have a higher risk of death. The trend towards late child bearing and older mothers can create higher risk pregnancies with potentially higher rates of adverse outcomes. The increase in infant mortality since 1999 is being closely examined to better determine the underlying reasons for this increase.

Some regions recorded lower infant mortality rates since 1999 and others higher. In the last five years, the HSDA with the highest rate is typically 1.5 times higher than the provincial average. The lowest regional rate is typically at 83 per cent of the provincial rate – a possible target for many HSDAs to aim toward (see Figure 2.9). Infant mortality rates for the Aboriginal population (based on Status Indian data) traditionally higher than the rates in the general population, have also been steadily declining over the last several decades. In the 1950s, 120 aboriginal infants per 1,000 died in their first year, a rate five times the provincial average. By the year 2000, the rate was 4.0 per 1,000, comparable to that of the general population (Provincial Health Officer, 2002).

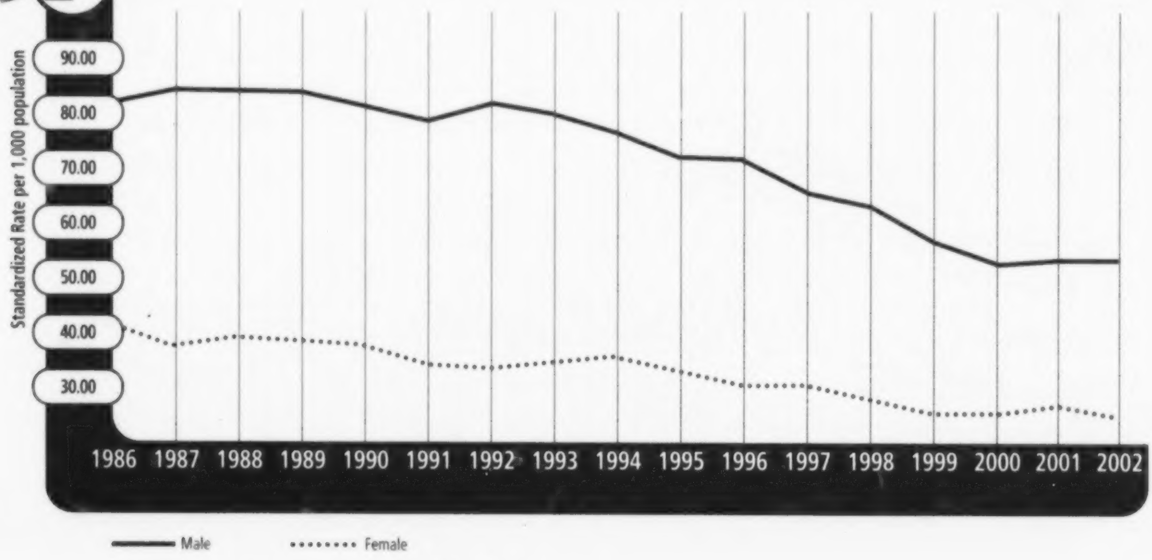
Potential Years of Life Lost (PYLL)

Fewer people are dying prematurely in B.C., but lower rates are attainable. About 28,000 deaths occur each year in B.C. and four in 10 of these occur in persons under the age of 75. Every death occurring to a person younger than age 75 is considered a premature death and results in potential years of life lost.

In 2002, close to 11,200 deaths in B.C. were considered premature, accounting for 186,300 potential years of life lost. This translates as approximately 46.0 potential years of life lost per 1,000 standard population in 2002. Figure 2.10 illustrates that trend, showing the 30-per-cent drop from 1986 for this indicator for both males and females.

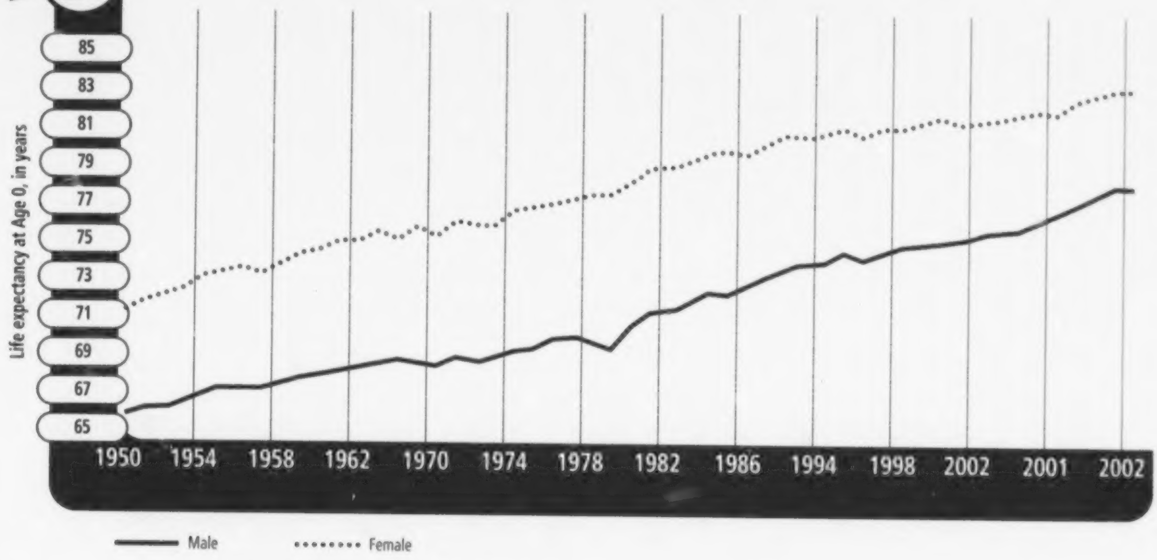
Many of these premature deaths are still amendable to prevention. In 2002, lung (and trachea) cancer accounted for 10.7 per cent of premature deaths. Tobacco smoking causes the majority of lung cancers. Motor vehicle crashes took 352 lives prematurely (3.1 per cent) and many of these could be prevented by a reduction in hazardous driving. Priorities can be established by examining age-specific rates for the major causes. For example, motor vehicle crashes are the leading cause of death for

FIGURE 2.10 **Potential years of life lost (All causes), Males and females, B.C., 1986 to 2002**



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

FIGURE 2.11 Life expectancy at age 0, Males and females, B.C., 1950 to 2002



Source: BC STATS, B.C. Ministry of Management Services. http://www.bcstats.gov.bc.ca/DATA/POP/vital/bcexp.htm

those between 15 and 24 years, and are a major cause of death for those younger than 15 and those between 25 and 44 years (see Goal 6 for more information). Prevention programs aimed at these risk groups could help reduce the rate.

Life Expectancy

Life expectancy for Canadians and British Columbians continues to be one of the highest in the world. During the short span of the four years since we first reported on the health goals, life expectancy has increased by 0.8 years. Males are experiencing a greater rate of increase in life expectancy than females. While the long-standing gap between the life expectancy of men and women still exists, the gap widened from 6 years in the 1950s to about 7 years in the 1970s, and since 2000 has narrowed to less than five years (see Figure 2.11).

Increases in life expectancy are due to both reductions in deaths at younger ages and to increases in longevity at older ages. Life expectancy at age 65 continues to increase as B.C. seniors enjoy better health. In 1950, life expectancy at age 65 was 13.7 years for males and 15.7 years for females. Seniors in 2002 can enjoy higher life expectancies – 18.2 years for males and 21.3 years for females.

There are regional differences in life expectancy. Residents of Richmond HSDA continue to enjoy the highest life expectancy – 81.8 years. Those in the Northwest HSDA have the lowest life expectancy at 77.7 years.

? Where Do We Go From Here?

Infant Mortality

Infant mortality rates have been declining for decades, but there is evidence they can be reduced even further. In the 1999 Annual Report, the lowest regional infant mortality rate was 3.4 per 1,000 live births. This was set as an achievable target for all regions. In 2002, three out of the 16 HSDAs had infant mortality rates lower than 3.4 per 1,000 live births and East Kootenay HSDA had no infant deaths. This means there is room to improve for the remaining twelve HSDAs.

Where Do We Go From Here?

Life Expectancy

Most experts believe there is a biological maximum for the age humans can achieve. While there are still differences within our own population, the goal should be for those regions with lower life expectancy to reach the life expectancy of the best region, which is Richmond at 81.8 years (1997 to 2001 annual average).

PERSONAL CHOICES VERSUS SOCIETAL CONDITIONS

Individuals have a great deal of control over how healthy they are and how healthy they feel. In fact, the list of personal choices to improve health is becoming well known:

1. Don't smoke. If you can't stop, cut down.
2. Eat a balanced diet with plenty of fruits and vegetables.
3. Keep physically active.
4. If you drink alcohol, do so in moderation.
5. Practice safe sex.
6. Drive safely.
7. Use seatbelts in cars; a helmet when bicycling, a lifejacket in a boat, and a smoke detector in the home.
8. Protect yourself and children from the sun.
9. Learn basic first aid.

But we also know that good health is equally reliant on factors over which many have little control. An alternative list of do's and don'ts, adapted from Dr. David Gordon of the United Kingdom, wryly illustrates the influence that societal and family conditions can have on how healthy people are and feel:

1. Don't be poor, or at least try not to be poor for too long.
2. Have wealthy parents with good DNA.
3. Have access to high quality education including university.
4. Don't work in a stressful, low-paying job.
5. Don't live in damp, low-quality housing.
6. Don't become unemployed.
7. Don't become homeless or mentally ill.
8. Don't become disabled.
9. Don't become old.

What Actions Can We Take?

Infant Mortality

Individuals:

- Maintain a healthy diet, especially expectant mothers.
- Keep a smoke-free home, especially families with young infants.
- Take necessary precautions at home, such as putting young infants on their backs to sleep, which has been shown to prevent sudden infant death syndrome.

Health Providers:

- Screen women for health risks and chronic conditions before conception.
- Provide high-quality and coordinated pre and post natal care, as well as during labour and delivery.
- Reach expectant mothers at risk of low birth weight through programs such as the Pregnancy Outreach Program.

Government:

- Provide continuing economic and social supports for women during and after their pregnancies.

What Actions Can We Take?

Life Expectancy

Individuals:

- Keep active, do not smoke, eat well and maintain social relationships such as through volunteering and participating in community activities.

Government:

- Take actions to reduce the burden of chronic and preventable diseases such as cancer, heart disease and diabetes.
- Manage chronic and preventable diseases more effectively through province-wide education and prevention strategies.

SPOTLIGHT ON SENIORS' HEALTH STATUS

In general, B.C. seniors are aging well and enjoying improved health status over previous generations. Where data permits, discussion on seniors is segregated into young seniors (65 to 74 years) and older seniors (75 and older).

Well-being

- Approximately one-third of seniors were found in each of the three self-rated categories – "very good/excellent", "good" or "fair/poor". There were only slight differences between younger and older seniors.

General Health

- Three out of four younger seniors versus one out of two older seniors, described their functional health as very good or perfect. A higher proportion of older (56.9 per cent) than younger seniors (34.4 per cent) report having some activity limitation. However, the difference is not large in the proportion of younger (14.1 per cent) and older seniors (16.8 per cent) who reported one or more disability days in the last two weeks.

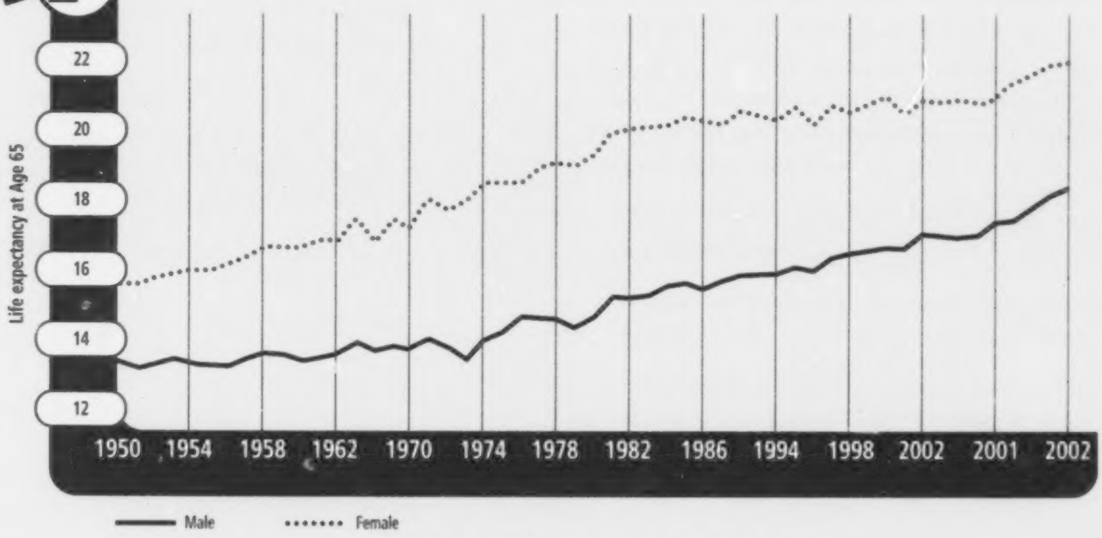
Health Conditions

- Arthritis is a chronic condition that increases with age. Almost half of all older seniors report being diagnosed by their physician as having arthritis or rheumatism. Fewer younger seniors (36.9 per cent) reported being diagnosed with either of these two chronic conditions.
- The likelihood of being diagnosed with high blood pressure and diabetes also increases with age.

Life expectancy

- Life expectancy for B.C. seniors continues to increase (see Figure 2.12). During the past half-century, life expectancy beyond age 65 has increased by 33 per cent for males, from 13.7 years in 1950 to 18.2 years in 2002. For the same period, female seniors enjoyed similar rates of increase in life expectancy from 15.7 years in 1950 to 21.4 years in 2002.

FIGURE 2.12 Life expectancy at age 65 years, Males and females, B.C., 1950 to 2002



Source: BC STATS, B.C. Ministry of Management Services. http://www.bcstats.gov.bc.ca/DATA/POP/vital/bcexp.htm

LIMITATIONS TO SENIORS' HEALTH STATUS DATA

Collecting data in more defined categories can be a very complex and expensive process. Thus, data on seniors (or any age group) disaggregated by income, education, ethnic or geographical categories are not readily available. If available, they may not be reliable because small samples are susceptible to high variability.

However, from time to time, there are research studies that collect detailed data about particular groups of seniors. For example, a recent study of the *Health and Well-being of Chinese Seniors in Canada* revealed that seniors within Canada's largest visible minority group, the Chinese, are not as healthy as elderly Canadians within the general population (University of Calgary, 2003). This study covered seven major Canadian cities, including Vancouver, and found that poor financial status among those studied was highly related to poor health. In understanding the health of our seniors we need to gather more reliable data, especially at sub-population levels, to find solutions in closing discrepancies.

A Portrait of Seniors in Canada (Statistics Canada, 1999) is another comprehensive study that we can depend on to describe the health of the nation's elderly. It is also a reliable source for understanding the changing socio-economic status of seniors. Many of the findings at the national level confirm experiences in our province. It is especially encouraging to know that while eight in 10 seniors who live at home have been diagnosed with at least one chronic health condition, most seniors said that their overall health is relatively good. This demonstrates the importance of positive attitudes when it comes to self-rated health.

HEALTH GOAL 1

CHAPTER 3

Living and Working Conditions

GOAL 1: LIVING AND WORKING CONDITIONS

Employment

Unemployment rate – *Not much change*
Workplace injuries – *Improving*
Decision latitude at work – *No recent data*

Income

Low income rate – *Not much change*
Income assistance rate – *Improving*
Income inequality – *Not much change*

Participation and social integration

Social support – *Not much change*
Volunteer rate – *Worsening*
Crime rate – *Improving*
Children/youth in care – *Not much change*

Housing

Housing need – *No recent data* (likely worsening)

Positive and supportive living and working conditions in all our communities

The conditions in which we work and live affect not only our mental and social health, they have a strong bearing on our physical health as well. Meaningful work, healthy and supportive workplaces, sufficient income, supportive families and friends, and safe and well-designed communities are important determinants of good health. Goal 1 focuses on the following categories and their indicators:

- **Employment** – unemployment rates, workplace injury, decision latitude at work
- **Income** – low income rates, income assistance, income inequality
- **Participation and social integration** – social support, volunteer rate, crime rate, children and youth in care
- **Housing** – housing need, homelessness.

Employment

A healthy, diverse economy provides opportunities for employment. It also creates workplaces that are safe and employers who value their workers. Productive, meaningful work or work in which employees have high degrees of control are strongly associated with better health outcomes. Conversely, unemployment or a lack of control over work situations is associated with poorer health. The three indicators used to gauge employment and working conditions are unemployment rate, workplace injury rates and decision latitude at work.

What Do The Indicators Show?

- Unemployment rates in B.C. have been higher than the Canadian average for the last three years but have generally declined from unprecedented highs in the 1980s. However, some regions such as Cariboo and North Coast /Nechako, saw unemployment rates climb over the last three years to a high of 12.6 per cent. Youth unemployment is a particular concern province-wide.
- Injury rates have continued to decline over the last decade in B.C. among all ages. However, young workers still have disproportionately higher rates of injuries compared to other age groups.
- No new information is available about decision latitude at work, a measure of the amount of control one has over one's working life. This measure has been shown to have a strong relationship to rates of diseases and therefore more data should be collected about this indicator in B.C.

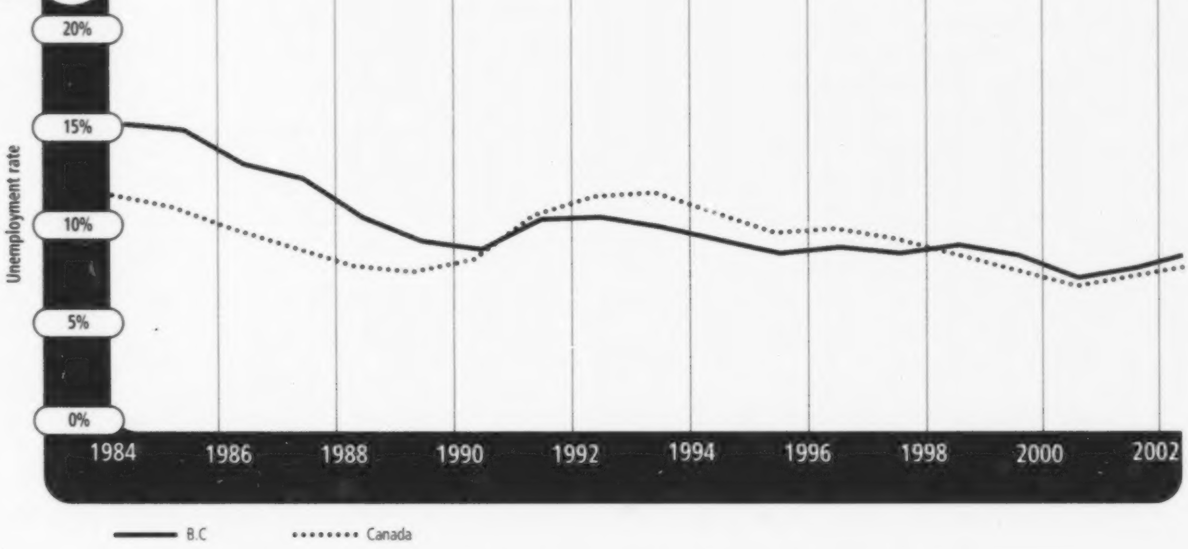
Unemployment

Self-worth and well-being are closely associated with employment status. What we do for a living determines our income and identity. British Columbia's economy over the last two decades has undergone significant shifts, with the proportion of resource-based manufacturing and primary goods production shrinking in comparison to the service sector industries.

Except for the period from 1990 to 1997, unemployment rates in B.C. have typically been higher than rates in the rest of the country (see Figure 3.1). But the general trend has been downward, with B.C.'s annual unemployment rates dropping from a high of 14.8 per cent in 1984 to less than 10 per cent since 1993. For 2000 and 2001 the unemployment rate was below 8.0 per cent but returned to 8.5 per cent in 2002.

FIGURE 3.1

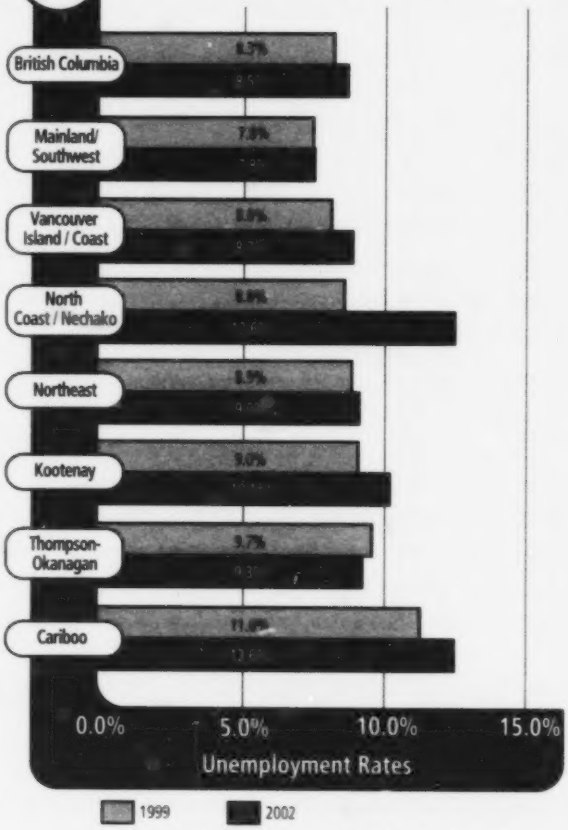
Unemployment rates, B.C. and Canada. 1984 to 2002



Source: Statistics Canada. Prepared using data from Labour Force Survey, by BC STATS, B.C. Ministry of Management Services.
http://www.bcstats.gov.bc.ca/data/lss/lfs/bccanlfs.pdf

FIGURE 3.2

Unemployment Rates, Labour Regions in B.C., 1999 compared to 2002



Source: Statistics Canada. Prepared using data from Labour Force Survey, by BC STATS. B.C. Ministry of Management Services. http://www.bcstats.gov.bc.ca/data/lss/lfs/lfspage.htm

Regions with a higher dependence on primary goods production, particularly forestry, experienced a greater increase in unemployment rates compared to other regions. North Coast/Nechako saw the greatest increase in the recent years, from 8.8 per cent in 1999 to 12.6 per cent in 2002 (see Figure 3.2).

Unemployment rates in the urban centers are typically lower than the less populated regions and mirror the provincial trends. For example, metro Vancouver Mainland unemployment rates were lowest in 2000 (5.9 per cent) – the same year provincial unemployment rates were also lowest, at 7.2 per cent.

Youth, women, Aboriginal people, visible minorities and persons with disabilities traditionally face disadvantages in employment, including high unemployment, occupational segregation, pay inequities, and limited opportunities for career progression. In some cases, unemployment rates for these groups can be almost double the provincial rate.

In the 1999 Annual Report, we documented the gains made during the 1990s of women moving into traditionally male-dominated professions. This trend has continued with women during the last decade accounting for nearly 50 per cent of the growth in occupations that normally require a university education. The female workforce grew by 23.4 per cent in B.C between 1991 to 2001. According to the 2001 Census, however, the most common jobs for women in Canada are still in sales and secretarial positions, which are usually lower-paying positions with less autonomy.

Young people have the highest level of unemployment. According to BC STATS, B.C.'s young people (age 15 to 24 years) in 2002 faced an unemployment rate of 14.3 per cent, down from a high of 17.3 per cent in 1998. Despite the improvement, B.C.'s youth unemployment rate in 2002 is higher than the Canadian average

IMPACT OF "TRAINING" WAGE

In November of 2001, B.C. introduced a training wage of $6 per hour, which applies only to employees with with less than 500 hours paid work experience. At the same time, the minimum wage was raised to $8 per hour for all others, becoming the highest in the country.

Business leaders and company owners have hailed the training wage as a way to encourage employers to take on inexperienced help, spur youth employment and create a wider pool of trained workers.

However, youth and labour groups have criticized it as unfair and discriminatory. They claim that some employers fire workers before they reach 500 hours, hiring novices to replace them at the lower wage and making it harder for youth with work experience to continue employment, find new jobs, or get wage increases.

With twice the rate of unemployment of other age groups, young people need effective strategies to help them enter and stay in the workforce. It is not yet clear what the overall impact of this wage policy is. Therefore, an independent evaluation is needed to assess whether the policy is achieving its desired aims.

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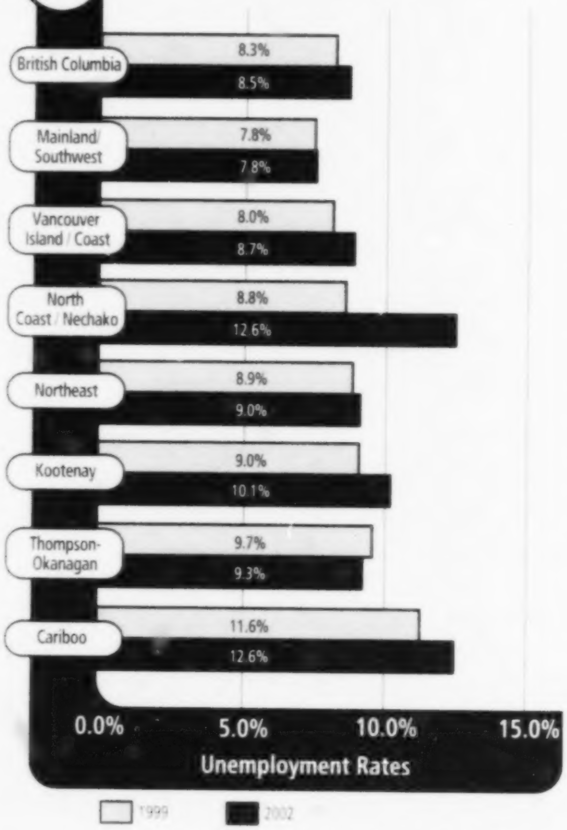

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of 13.6 per cent and considerably higher than Alberta (10.7 per cent), Saskatchewan (11.0 per cent), and Manitoba (10.2 per cent).

Workplace Injuries

The injury rate is the major indicator of overall health and safety in B.C. workplaces. Since the 1999 Annual Report, injury rates have continued to decline, dropping to a record low of 3.2 short-term disability claims per 100 person years of employment by 2002. That means that for every 100 full-time workers employed in the course of a year, 3.2 were injured.

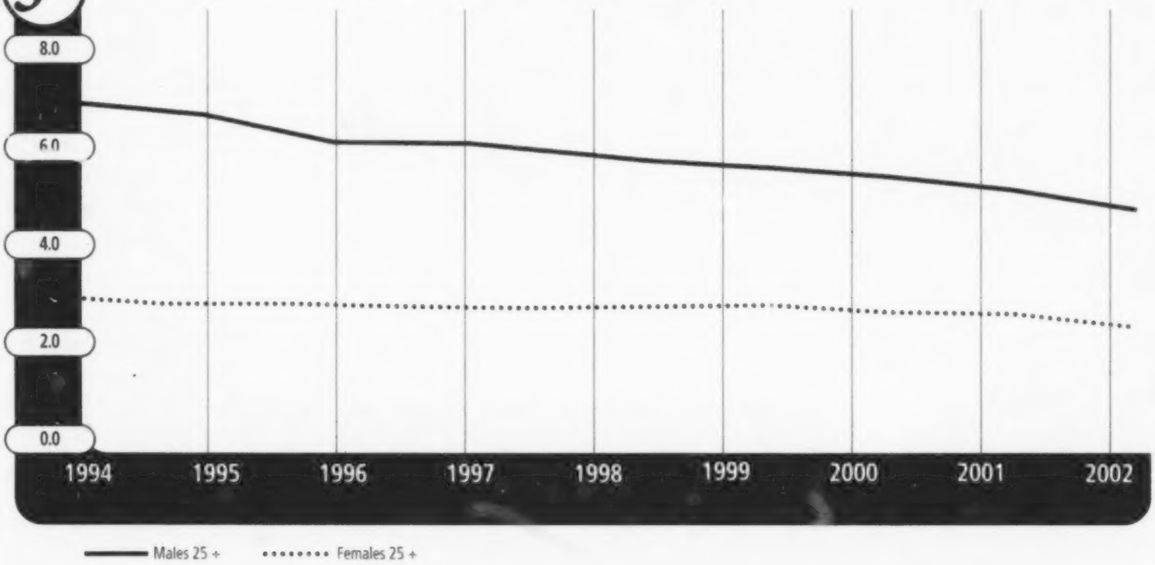
Men are injured far more frequently on the job than women and the decline in injuries is confined to males. The decline in injuries in the workplace for males has dropped from 6.8 (per 100 person years of employment) in 1994 to 4.8 in 2002 (see Figure 3.3). The injury rates for females remained almost unchanged over the last few years.

Some industries, however, need more attention. The injury rate for workers in the health care industry is higher than the provincial injury rate for workers in all industries combined. Almost 50 per cent of health industry injuries are musculoskeletal injuries, arising from improper handling of patients or materials. The Workers' Compensation Board (WCB) has been developing programs in the health sector to prevent the most common injuries, with good results. In health care, while employment rose 6.2 per cent between September 2001 and September 2002, the injury rate fell by 13.7 per cent in the same period.

Forestry is another higher-risk occupation. The rate at which forest industry workers are injured is more than twice the rate for other industries in the province. Between 1997 and 2001, the average injury rate was 9.6 per 100 person years of employment compared with the provincial average of 4.2 over the same five-year period. While the forest industry rate has been steadily declining, it still translates into one in 13 forest workers being injured or killed on the job each year. WCB is aiming prevention programs at this group, particularly among tree fallers.

The WCB also reports that each percentage point of reduction in injury rate translates into 618 fewer workers experiencing time lost due to injury, $10 million in avoided costs and approximately 30,000 productive days gained by the economy. This means that the declining injury rate from 1998 through 2002 resulted in 20,613 fewer workers losing time off work from injuries and saved more than 1 million days of work (T. Bogyo, Director of Corporate Planning, WCB, personal communication, June 10, 2003).

FIGURE 3.3 Injury rates by gender, Age 25 years and over, B.C., 1994 to 2002



Note: 2002 data is as of March 11, 2003. Injury rate is the number of claims per 100 estimated person-years of employment, including claims for short-term or long-term disability or survivor benefits in the year of the injury or in the first quarter of the year following the year of injury. Source: Workers' Compensation Board of British Columbia.

Injuries among young workers, although declining, continue to be a concern. British Columbia's 300,000 young workers, aged 15 to 24, remain a key prevention focus for the WCB through its Young Worker Strategy. In 2002, 170 young workers were injured every week, with five of those injuries resulting in permanent disabilities. Five young workers were killed on the job in 2002. This translates to a rate of 3.2 claims per 100 – a reduction of 32 per cent since 1997 when the young workers' injury rate was 4.7 per 100 person years of employment. This decline is encouraging and needs to continue. With some 8,800 young workers injured on the job every year, this is still too high a toll.

Decision Latitude at Work

How much control one has over one's working life and environment has been shown to have a strong bearing on health. The ability to control one's work circumstances is called "decision latitude". It is not solely the amount of stress on the job that undermines health, but the amount of control the worker feels over that stress. High stress with high control has little health impact, but high stress combined with low control is associated with much higher risk of disease. These findings have been replicated in numerous studies around the world following the famous Whitehall studies of British civil servants.

Unfortunately, recent data for this indicator is unavailable for British Columbia. In the 1999 Annual Report, we summarized data from 1994/95 that showed 68 per cent of British Columbians between ages 15 and 74 who are employed indicated a high level of decision latitude at work.

Decision latitude is an important indicator and new studies are showing that it applies not only to working life, but home life, too (Diez Roux, 2001). More research should be conducted and more data collected in B.C. on this important indicator and its association with health outcomes.

BRITISH CIVIL SERVANTS SHED LIGHT ON DECISION LATITUDE AND HEALTH STATUS

The most famous pair of studies illuminating the relationship between working life, status, control and health outcomes occurred over three decades among British civil servants. The first Whitehall study began in 1967 and followed 10,000 male civil servants. None were poor by society standards, but the study found a dramatic difference between those at the top of the Civil Service hierarchy and those at the bottom, with a four-fold greater risk of heart disease at the bottom (Marmot, 1984). Even after adjusting for known risk factors, such as smoking, obesity and physical activity, the gradient held true: the lower a worker was in the hierarchy, the higher the risk of all disease, not just heart disease.

In Whitehall II, a new group of 10,308 men and women civil servants were followed. The results of the second study found an association with workers who had low control over their daily activities in the workplace and a higher risk of cardiovascular disease and other causes of death. Low control also translated into increased risk of depression, particularly among women in low status jobs.

Marmot and colleagues concluded that giving employees more variety in tasks and a stronger say in decisions about work may decrease the risk of coronary heart disease and other illnesses (Marmot, 1997, Bosma,1997).

Where Do We Go From Here?

In 1999 we noted that eight per cent had been suggested as Canada's "natural rate of unemployment" (Beamish & Sanger, 1996). But we proposed other possible targets – the pre-1980s rate of 6.7 per cent, the rate of the best region (7.1 per cent for Victoria in 2002) or the rate of the best-educated group (6.2 per cent for university graduates in 2002).

We have surpassed the target set in 1999 for a workplace injury rate of 4.0 injury claims for every 100 person-years. The WCB has now set the target of reducing injury rates to 2.9 by 2005. This rate, or better, is achievable. As WCB notes, 157 workers were killed on the job in B.C. in 2002 and that is 157 too many.

According to the WCB, sudden upturns in the economy or surge in new jobs are often accompanied by an increase in injuries when untrained, new, or young workers are employed. We must plan for and guard against these predictable increases by having prevention programs and injury reduction training in place.

Monitoring the rate of decision latitude among B.C. workers, and implementing and evaluating innovative ways to increase employees' workplace control are areas that need more attention in B.C., especially as most employee health programs overlook this important aspect of worker health.

What Actions Can We Take?

Many of the recommendations we made in 1999 still apply, with a few variations:

Individuals:

- Make occupational health and safety a priority.
- Take stock of your knowledge, skills and abilities regularly and if necessary, re-train to upgrade or change professions.
- Explore other work options such as sharing jobs, working part-time or at home, especially when there is a need to care for young children or aged parents.

Employers:

- Make occupational health and safety a priority.
- Increase employment and advancement opportunities for disadvantaged groups – women, youth, Aboriginal, visible minorities and people with disabilities.
- Invest in re-training and upgrading employees.
- Implement workplace wellness programs.
- Provide more flexible work arrangements and family-friendly policies.

Governments:

- Monitor the effectiveness of policies and decisions that may adversely affect particular industries or groups of people. In particular, monitor the impact of the training wage.
- Monitor the impact of unemployment in certain sectors on injury rates to ensure that any rebound in employment is not accompanied by a jump in injury rates.

Income

Income and health are closely related, but it is not simply that the wealthy have better health than the poor. At every level of income, the level above has better health than the level below, making a staircase-like gradient that climbs from the poorest to the wealthiest in society. Inequalities in income, with large gaps between the richest and poorest, are also strongly linked to ill health.

Income data are very complex to analyze. There are many ways to examine income: before tax, after tax, personal income or household income. Some people have employment earnings only; others may have no employment earnings yet obtain a great deal of income from investments. It can be difficult through Census data or other indicators to determine who fits where. In addition, there is no single agreed upon "poverty line" and each method of attempting to rank relative wealth and economic deprivation arrives at different values.

What Do The Indicators Show?

- Traditional measures of low income in B.C. have fluctuated over the last three years with about 12 per cent of the population in B.C. being below a low-income threshold.
- A new Human Resources Development Canada (HRDC) measure, which looks at the ability to afford the basic necessities of life based on where individuals live, found B.C. had the second worst ranking in Canada, second only to Newfoundland/Labrador on measures of relative deprivation. This is largely due to high housing costs in Vancouver and Victoria. According to the new measure, one in five British Columbians struggles to buy the basic necessities of food, shelter, clothing and transportation.
- Single-parent families have experienced a growth in income over the 1990s in all of Canada, including B.C.
- Eighteen per cent of all children in Canada versus 17 per cent of seniors are living below the low-income threshold, according to before-tax income in the 2001 Census. When after tax figures in B.C. are examined the percentage of children considered low income drops to 11.5 per cent and low-income seniors drop to 9.4 per cent.
- Income assistance rates in B.C. have dropped from a high of 9.8 per cent in 1995 to 5.0 per cent in 2002 but a change in policy makes it difficult to evaluate this change.
- The gap between rich and poor, however, has continued to widen, with the incomes of the wealthiest 10 per cent climbing in the last decade more than any other income level. Vancouver has one of the widest incomes gap in the country.
- Based on the "income share" of the poorest half of households, most regions in B.C. have values tightly clustered around 21.2 per cent, mid-way between equality and inequality.

Low Income Rate

In the 1999 Annual Report and for this report, we determine low income rate by looking at the Low-Income Cut-Off (LICO). This is based on a scale of after-tax income in relation to expenses relative to other Canadians. Another measure of low income rate is the Low Income Measure (LIM) – a general measure used to compare countries internationally. It draws the poverty line at one-half the median income of an equivalent household. In 2003, a third indicator was introduced by HRDC using Statistics Canada data, the Market Basket Measure (MBM). This calculates the number of people unable to afford a set of goods and services and takes into account the varying costs in different cities and communities across the province and the country. The Market Basket Measure is the first indicator to express poverty as the inability to pay for specific necessities rather than to express it as relative to the fortunes of other Canadians. Each method for measuring poverty results in a slightly different proportion of the population being deemed poor and each measure has its strengths and weaknesses.

Low Income Cut Off

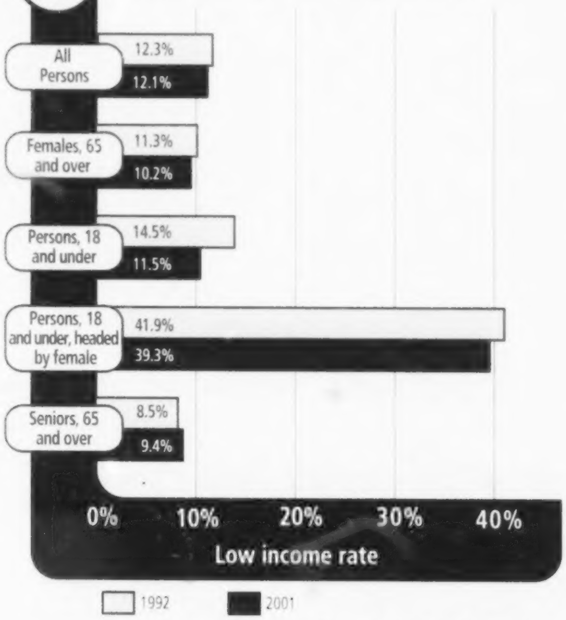
For more than four decades, Statistics Canada has been using a complex calculation to determine Low-Income Cut Off (LICO). This measure determines the relative number of people living in poverty, based on the size of the family and varying costs by community size. A low-income family is one that spends a much higher percentage of its income on the necessities of life than the average family of the same size.

There are separate cutoffs for seven sizes of families. For 2001, LICO rates ranged from $10,201 for one person living in a small rural community to $40,468 for a family of 7 or more persons living in a city of more than 500,000 people. An advantage of LICO rates is that it has been tracked over time. As well, based on Gallup polls from 1976 to 1997, LICO rates have been consistently close to what the public itself judges to be adequate income. One of the disadvantages, however, is that it does not take into account geographic variations and the differences in housing costs between communities. This tends to underestimate poverty in high rent cities like Vancouver.

In British Columbia, the proportion of the population below LICO was 12.1 per cent in 2001 (Statistics Canada, 2003 June). The proportions of persons under 18 years of age living in poverty (based on LICO) have fluctuated slightly over the last decade from a low of 10.3 per cent in 1998 to a high of 15.9 in 1996. Females are more likely to be in LICO brackets, especially if they are older (age 65 years and over) or heading a family alone with children under 18 years of age. However, there are data to show that the proportion of most of these traditionally disadvantaged groups is decreasing (see Figure 3.4).

Based on the 2001 Census, which is before-tax, for the first time in 2000 more Canadian children (18 per cent) were living in low income families than seniors (17 per cent) (2001 Census, May 21, 2003). Most children live with their mothers and so child poverty can be reframed as the poverty of child-bearing women. Data from Figure 3.4 (although from a different source – the Survey of Labour and Income Dynamics) suggests that our tax system has been an important mechanism for redistributing income. Based on LICO, an after-tax measure, 11.5 per cent of children and 9.4 per cent of seniors in B.C. are considered to fall in low income categories in 2001.

FIGURE 3.4 Prevalence of low income after tax, Selected groups, B.C., 1992 compared to 2001



Note: Low income after tax cut-off amounts are dependant on the size of the family unit and the population size of the community or city where the family unit is found.
Sources: Statistics Canada. (2003, June). *Income in Canada 2001*, Catalogue No.75-202-XIE.

Market Basket Measure

Developed by Human Resources Development Canada and adopted by the federal government in the spring of 2003, the Market Basket Measure accounts for regional differences in the cost of living. It calculates the number of Canadians unable to afford a detailed set of goods and services. This includes food, clothing, shelter, transportation and sundries like stamps and video rentals – items that are deemed the threshold of a decent standard of living in Canada.

People are considered to fall into relative poverty when their income after taxes, child support, payroll deductions and out-of-pocket medical expenses falls short of covering the cost of the "basket" of goods priced in 48 different parts of the country.

Under this new measure, the poverty rate has increased substantially in British Columbia compared to LICO, with 20 per cent unable to afford the basket, largely because of the higher rents/housing costs and higher grocery bills in most of British Columbia. Vancouver emerged as the most expensive city in Canada in which to live. This ranking gives B.C. the nation's second highest rate of relative poverty after Newfoundland/Labrador.

Criticisms of the Market Basket Measure usually centre on what should be in the basket, either tending towards the bare-bones essentials on the one hand or, on the other extreme, including items that some might deem to be frills or discretionary spending. However, it does give a more realistic view of how many people in B.C. struggle to afford a standard set of items. It also better defines the depth and breadth of poverty in the province, and illuminates what it costs to raise a family or to live in different regions.

Sometimes this lack of money translates into not having enough food to eat. In a separate survey, 8.2 per cent of British Columbians said they sometimes or often do not have enough to eat (CCHS 2000/01). A further 14.8 per cent reported sometimes or often not eating the quality of food they wanted due to insufficient funds. The nutritional findings from this survey are discussed in more detail in the healthy eating section under Goal 2: Individual skills, capacities and choices.

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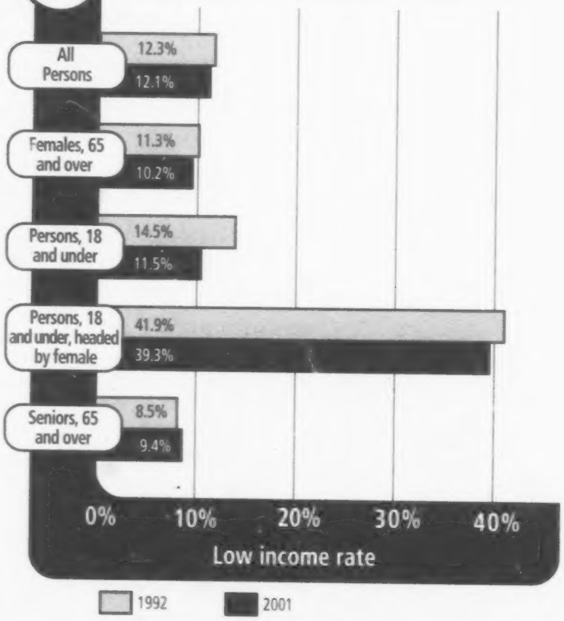

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Income Assistance Rate

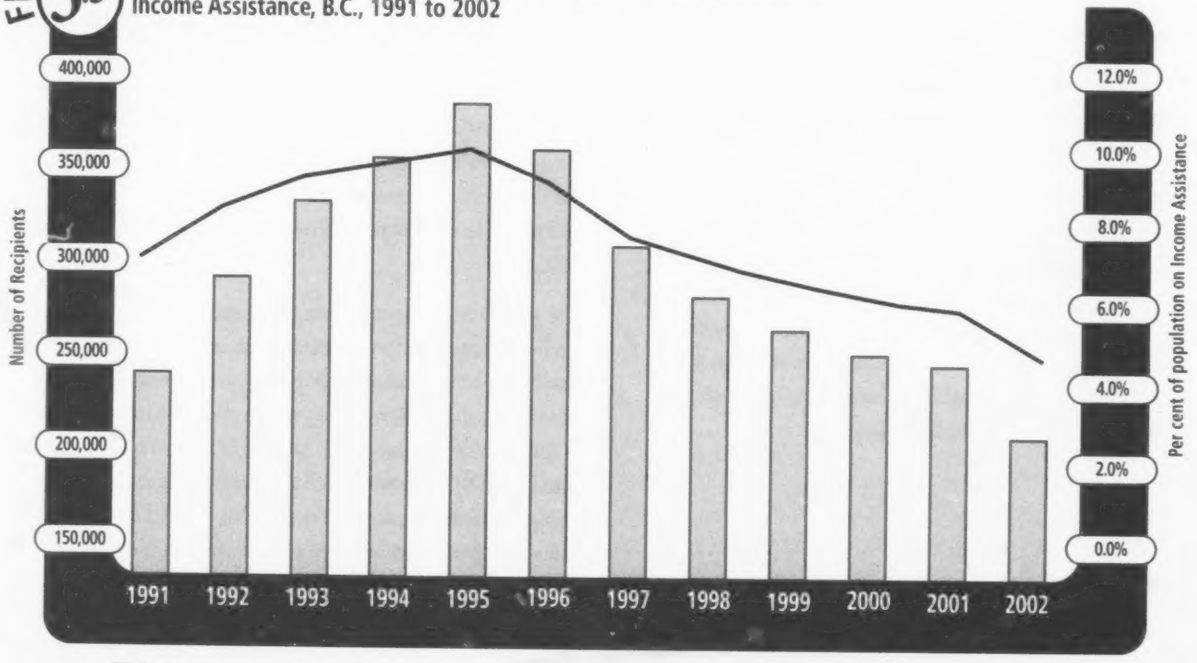
The British Columbia Employment and Assistance (BCEA) program replaced the BC Benefits program in late 2001. Run by the B.C. Ministry of Human Resources, the BCEA emphasizes personal responsibility and active participation, focusing on assisting individuals and families in need and moving people from income assistance to sustainable employment. Most people applying for income assistance are now required to complete an employment plan, specifying the steps they will take to find and keep a job. The plan is unique to each individual. Under the program, the B.C. Ministry of Human Resources is spending about $300 million over three years on job placement and training for jobs programs. In the spring of 2003, it was reported that since June of 2001, some 15,000 income-assistance clients have been placed in jobs through ministry contracted job placement agencies.

Even before the inception of the BCEA, the rate of people on income assistance in B.C. had started to drop from a high of 9.8 per cent in 1995 to 6.3 per cent in 2000 (see Figure 3.5). As of May 2002, nearly 39,000 families in B.C. were receiving income assistance, including 66,500 children.

Quarterly surveys conducted by the Ministry show that over 70 per cent of respondents who were previous income assistance recipients left the program because they found work or returned to school (B.C. Ministry of Human Resources, 2002). Six out of 10 respondents who left the program for work and who were not in school at the time of the survey stayed off welfare for at least six months. Their average income was almost three times more than the income received from BCEA.

According to Statistics Canada, the B.C. finding is consistent with experiences in other provinces, with some of the 60 per cent of people who left welfare registering dramatic gains in family income over the last decade. Of leavers who increased their income, one third jumped from an annual after-tax income of $13,900 while on welfare to as much as $33,600 two years later. Incomes remained high during the following five years. About one in three, however, did not experience gains and saw their income decline dramatically after leaving welfare, some to a low of only $1,500 annually. The reasons for the marked decline in family income for a subset of people are not clear (Statistics Canada, 2003).

FIGURE 3.5 Number of Income Assistance recipients and per cent of population on Income Assistance, B.C., 1991 to 2002



Notes: British Columbia Employment and Assistance (BCEA) replaced BC Benefits in late 2001, as the new income assistance initiative.
Sources: Economic Analysis Branch, B.C. Ministry of Human Resources. Population estimates from BC STATS, B.C. Ministry of Management Services.

IMPACT OF "WELFARE-TO-WORK" POLICIES

Many North American jurisdictions over the last decade have introduced mandatory programs in which recipients of income assistance or welfare must be involved in work or work-related activities in order to receive benefits. The U.S. Congress, for example, passed legislation in 1996. Ontario, Alberta and B.C. have all passed types of welfare reform to improve training and skills or force recipients to seek work to keep receiving benefits.

In the U.S., a national evaluation of 20 welfare-to-work programs found that the majority benefit, but some are harmed (Manpower Demonstration Research Corporation, 2000). Some of the policy implications of the US findings include:

- To help the most disadvantaged groups, resources and programs must be targeted to them.
- A mix of job search and education increases earnings for the broadest range of individuals.
- Psychological problems of the recipients, particularly depression and low self-esteem, can be an impediment to the success of the programs. Research and strategies are needed to overcome this.

Finding effective ways to train and enable former welfare recipients to successfully enter the workplace and improve their earnings are important government policies. A meaningful and rewarding working life produces positive health benefits, as we have seen earlier in this chapter. However, more research is required in Canada to illuminate what types of programs benefit the most people; who will likely benefit and who will experience difficulty or declining income.

In addition, the impact on children of families who left welfare, either voluntarily or forcibly, needs to be evaluated. Do the policies effectively break the cycle of welfare dependence? Do they improve the lives of working mothers and their children? Or do they make their lives more difficult and predispose the children to more difficulties in obtaining a stable family life, adequate education and future employment in their own lives? In a recent report released by Campaign 2000, a national anti-poverty coalition, the face of child poverty is starting to change, from single mother on welfare to the working poor mother holding down at least one job (Philp, 2000).

We need to understand more clearly the pros and cons of these policies to ensure that they help rather than harm individuals and families.

Income Inequality

Over the last decade the saying: "the rich get richer" held true for B.C. as for the rest of Canada. According to Statistics Canada 2001 Census, the incomes for families at the lower half of income distribution showed little or no improvement through the 1990s, while the 10 per cent of Canadian families with the highest incomes experienced the greatest gains.

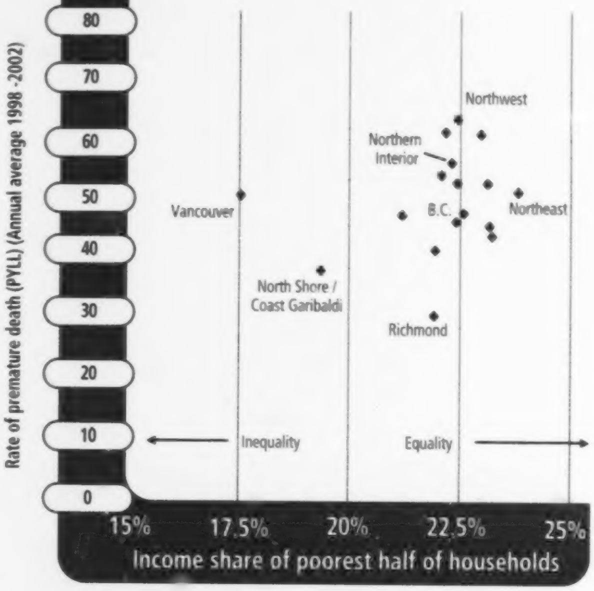
Among the 10 provinces, British Columbia and Ontario had the most unequal income distribution. Families in the top 10 per cent of income received almost 20 times more money than families in the lowest 10 per cent. Next to Toronto, Vancouver had the most unequal distribution of family income in Canada. In Vancouver, the bottom 10 per cent of families had an average income of $8,700 and the top 10 per cent had an average income of $205,200.

The gap has been widening over the period of 1993 to 2001. After-tax income expressed in quintiles, which are groupings of ranked families into five equal-number groups, is a measure commonly used in national studies. During that period, the average income of the wealthiest 20 per cent of families in Canada rose by 24 per cent ($21,900). The lowest fared least well – with average income rising just under 10 per cent ($1,800) since 1993. The middle three quintiles had increases of 13 to 15 per cent (Statistics Canada, 2002 June).

One way to assess income distribution equality, adopted in the 1999 Annual Report, is to compare the income share of the wealthiest half of households with that of the poorest half of households. A region with aggregate incomes of families in the bottom half totaling closer to 50 per cent of all incomes in the region can be said to have more income equality. Figure 3.6 illustrates the relationship between health status (measured by potential years of life lost) and the income inequality measure. Using data from the recent 2001 Census, most regions in B.C. have this measure of income inequality clustered around 21.2 per cent – a finding that has not changed much since the 1999 Annual Report. Differences in health status between HSDA's are not clearly linked to this measure of income disparity in B.C.

FIGURE 3.6

Relationship between income equality and health, B.C. Health Service Delivery Areas



Notes: Income share of the poorest half of households: the proportion of each region's household income that accrues to households earning less than the median income. In a situation of perfect equality, the bottom half (poorest) households would receive 50 per cent of the total income. In B.C., most HSDAs have values around 21.2 per cent, slightly down from 22.0 per cent as reported in the 1999 Annual Report.

Source: Income - Statistics Canada. Data prepared by Health Analysis and Measurement Group using data from 2001 Census, special tabulations. Health - PYLL is expressed as a rate per 1,000 population (age standardized) 1998-2002 annual average. B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. Unpublished tables.

Where Do We Go From Here?

As we noted in the 1999 Annual Report, some countries, particularly in Northern Europe, have been able to keep child poverty at a very low rate – less than five per cent even during periods of recession. With the LICO measure around 12 per cent in B.C. or the new Market Basket Measure showing 20 per cent of households struggling to make ends meet, we can do more to protect children from the life-long negative effects of growing up in relative deprivation and poverty.

International studies have shown that in more egalitarian societies, people tend to live longer and have better health (Marmot & Wilkinson, 1999, Marmot, 2003). Analyzing the results achieved by other industrial countries can provide some clues in setting a target for British Columbia. But as we noted in 1999, these are often difficult political and social policies that need a great deal of discussion and research.

There are signs, based on the indicators discussed, that decisions and policies we have made about social safety net and income redistribution at the provincial and national levels are slowly showing some positive outcomes. Many seniors are enjoying a better socio-economic status because of retirement saving programs and public income assistance programs like Old Age Security (see Seniors box on page 47), but many seniors, especially single women, have low incomes.

Over the last two decades the switch from universal family allowance to income-tested benefits has helped redistribute income to families with the lowest incomes. In 1981, under the old universal family allowance program, families with the lowest income received almost exactly the same payment in child benefits (about $1,280) as families with the highest incomes. Twenty years later, under the Canada Child Tax Benefit, the lowest income families received an average $2,378 per child per year and the 10 per cent of families with the highest incomes received only $26 in child benefits per child per year.

What Actions Can We Take?

Individuals:

- Be informed about the impacts of poverty in British Columbia.
- Participate in community programs that alleviate poverty and inequalities.
- Ask governments to enact policies and programs that will reduce poverty and inequalities.

Governments:

- Protect and improve social programs and tax policies that help to mitigate against income inequalities.
- Develop long-term strategies for supporting low-income families, such as lone-parent families.
- Develop indicators and collect data to measure income inequality and its impact on health.

Participation and Social Integration

The support we get from others throughout life has an important influence on health. In fact, connections to our family, friends and communities may be as important to health as currently recognized factors such as blood pressure, smoking and diet. The caring, respect and satisfaction that occur in social relationships guard against illness and help people cope when problems do arise.

Social support and levels of volunteering are two ways of measuring participation and social integration. Crime rates and the number of children and youth in care provide information about the levels of security and stress that families and communities are experiencing.

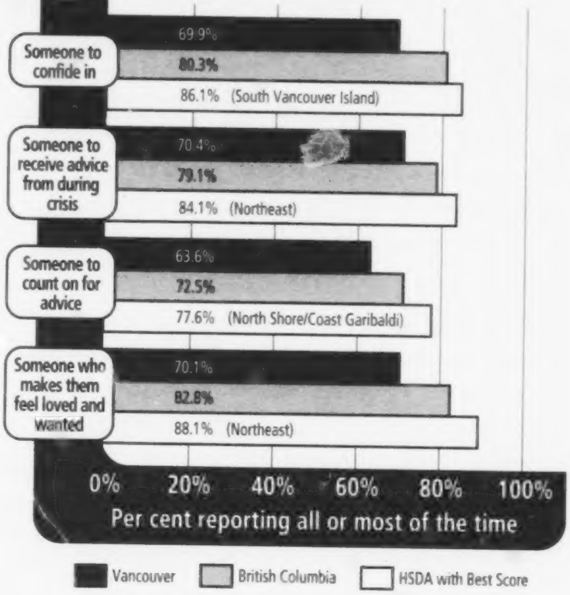
What Do The Indicators Show?

- Eight in 10 British Columbians have good social support, unchanged from the 1999 Annual Report.
- The social support that male seniors get through marriage is associated with a lower risk of dying after the age of 65.
- Fewer people are volunteering time but more money is being donated to charitable causes.
- Crime rates continue to drop in B.C. and around the world, largely due to an aging population.
- More B.C. children in recent years are in government care, though the rate of increase has slowed markedly.

Social Support

Based on the Canadian Community Health Survey 2000/01, eight in ten British Columbians reported that most or all of the time they have someone they can confide in, someone they can count on for advice or get advice from in a time of crisis, and someone who makes them feel loved and wanted. Women tend to have a higher level of social support than men based on these measurements.

FIGURE 3.7 Four measures of social support, Vancouver, B.C. and HSDA with the best score, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

People living in Vancouver and other more densely populated areas tend to have a lower level of social support than those in less populated areas. Even though there were high proportions of those living in Vancouver who reported that they felt supported (based on the four components listed above) for most or all of the time, the proportions were consistently lower than in other Health Service Delivery Areas (HSDA) (see Figure 3.7). This tells us that in our cities about 30 per cent of the residents may feel lonely and isolated.

For seniors, studies suggest the social support that comes with marriage has a protective effect on health, but only for men. Statistics Canada examined the mortality among a group of men and women aged 65 and older from 1994/95 to 2000/01 through the longitudinal National Population Health Survey. They found married men had a 40 per cent lower risk of death compared to men who were single, widowed, divorced or separated. Volunteering or participation in community organizations also had a protective impact for senior men. Nevertheless, women still tend to out-live men, whether they have social support or not (Statistics Canada, *The Daily*, May 23, 2003).

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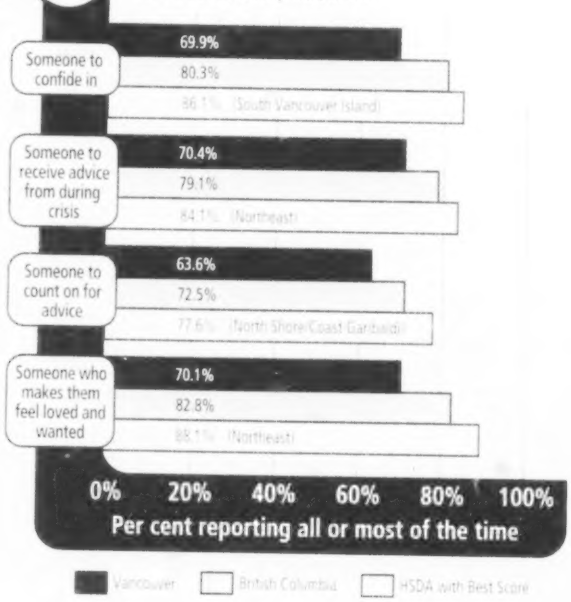

Source: Statistics Canada, Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

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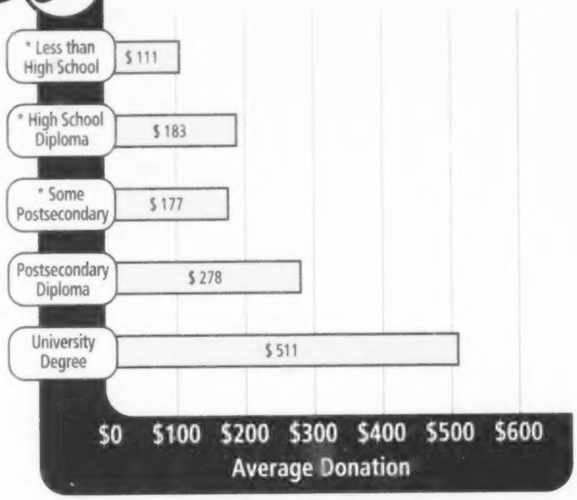
Volunteering

For many of us, it is just as important to give as it is to receive social support. We demonstrate our care for the communities we live in by volunteering time and donating money. In 2000, collective unpaid hours contributed by volunteers in Canada are equivalent to almost 549,000 full-time year-round jobs (Canadian Centre for Philanthropy, 2001). The volunteer rate, defined as the percentage of population who performed a service without pay in the last 12 months preceding the survey, was 26 per cent for British Columbia. This is a decrease of 4 per cent from the last survey conducted in 1997. Total volunteer hours have also dropped from 169 to 143 million hours. The rest of the country is experiencing the same trend.

Volunteers in British Columbia are typically 45 to 54 years of age, married, university graduates, employed, and belong to a household with income greater than $60,000. A slightly higher percentage of females than males volunteer in B.C.

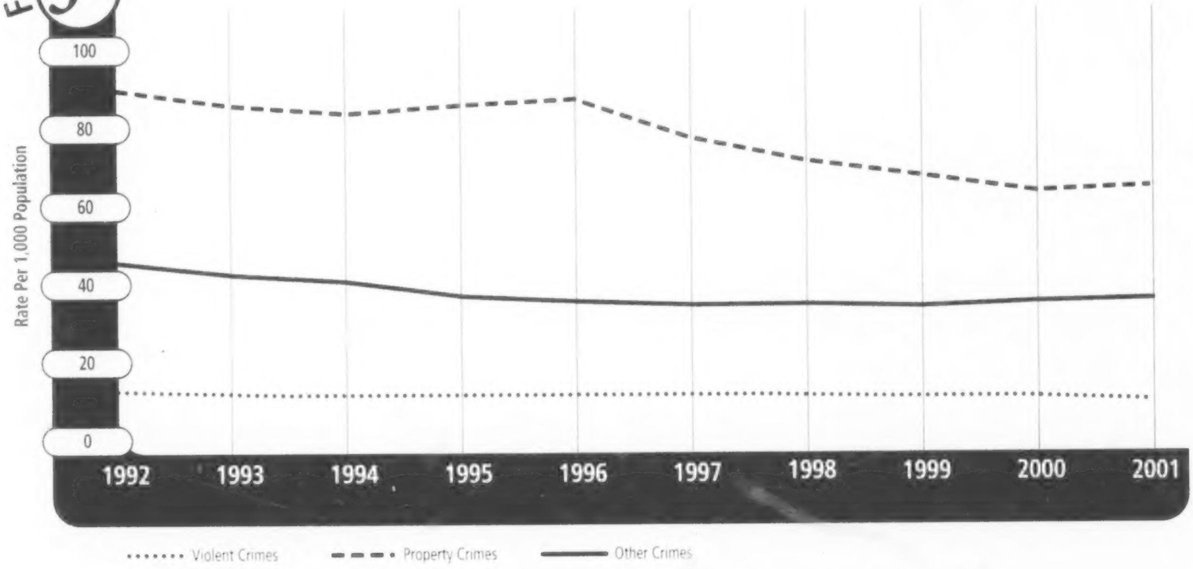
Although volunteer rates by British Columbians have dropped, total charitable donations have increased from $552 million in 1997 to $614 million in 2000. Charitable donations increase with income and education (see Figure 3.8). Religion is also a contributing factor in how much one donates or volunteers.

FIGURE 3.8 **Average donation by education level, B.C., 2000**



Notes: * denotes small sizes but data generally illustrate that the average donation increases with education.
Sources: Cananadian Centre for Philanthropy & Statistics Canada. (2001). *Caring Canadians, Involved Canadians.* Data from the National Survey of Giving, Volunteering and Participation 2000, http://www.statcan.ca/english/freepub/71-542-XIE/711542-XIE00001.pdf

FIGURE 3.9 **Crime rate, B.C. 1992 to 2001**



Source: Police Services Division, B.C. Ministry of Public Safety and Solicitor General. (2001). *Police and Crime, Summary Statistics, 1992-2001.* http://www.pssg.gov.bc.ca/police_services/publications/AppC.pdf

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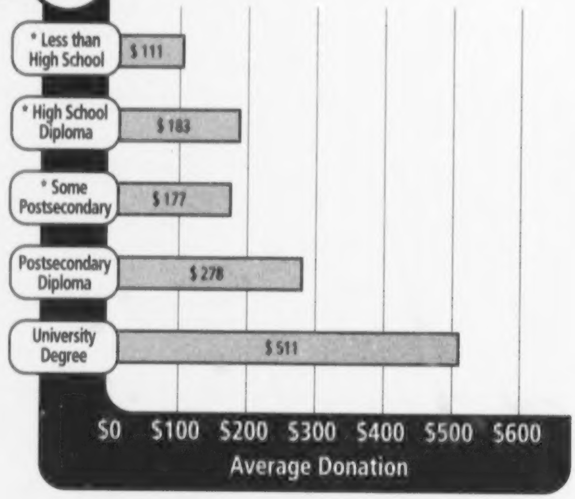

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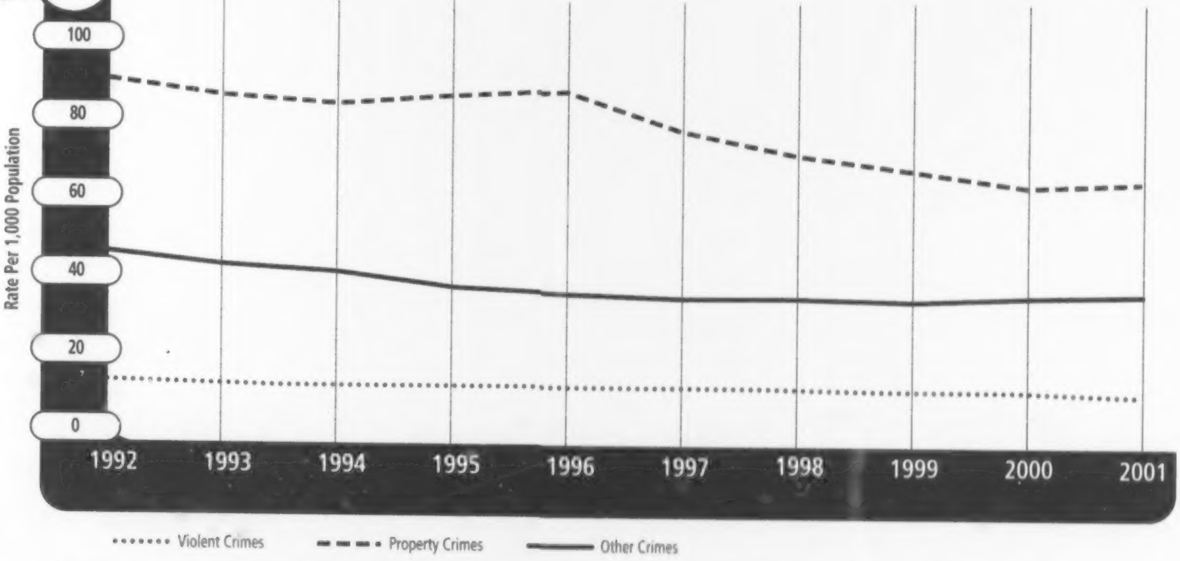


Source: Police Services Division, B.C. Ministry of Public Safety and Solicitor General. (2001). *Police and Crime, Summary Statistics, 1992-2001.* http://www.pssg.gov.bc.ca/police_services/publications/AppC.pdf

Crime Rate

According to the summary statistics published by the Police Services Division of the province, overall crime rates have steadily dropped in the province since 1992 (see Figure 3.9). This includes crime rates for the three major categories – property crime, violent crime and other (vandalism, trespassing, weapons possession, etc.). In total, the crime rate has decreased 25 per cent over the last decade, reaching the lowest rate in 20 years.

Crime rates are dropping across the country and around the Western world. This is due in part to an aging population, resulting in fewer males between ages 15 to 24 – the age when most violent and property crimes are committed. Policing efforts at the community level and better law enforcement practices are other reasons for the decrease. Unemployment rates have been declining in recent years and more employment typically leads to reduced crime.

Children And Youth In Care

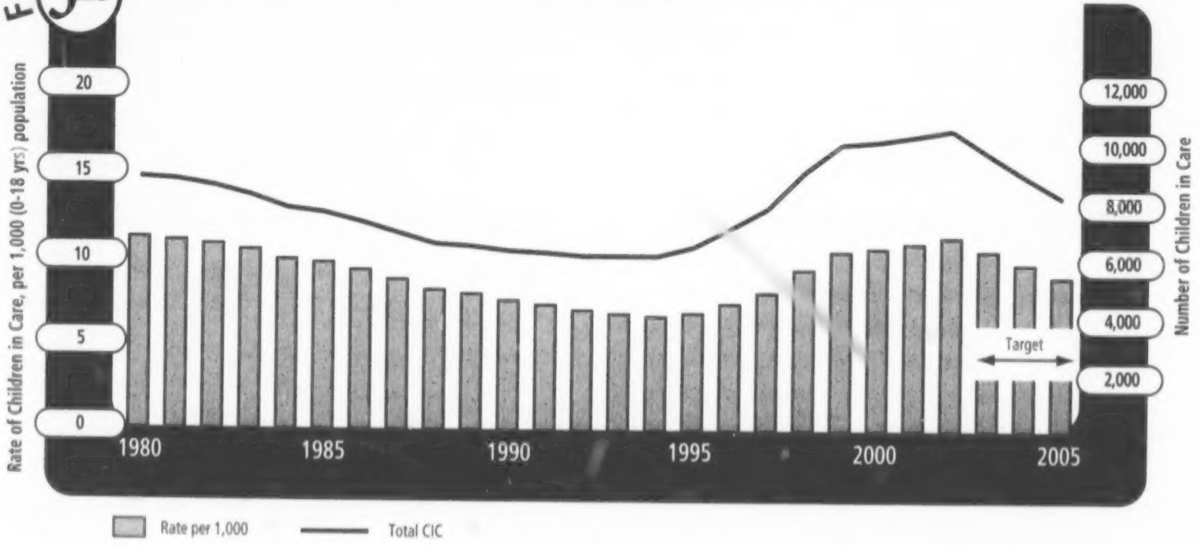
Most children in B.C. live in families with one or both of their biological or adoptive parents. Current policy is to avoid removing children from the home and to support families to care for their own children. In cases where this cannot be done without risk to the health and safety of children and youth, the B.C. Ministry of Children and Family Development (MCFD) provides substitute parenting, usually in the form of foster homes. Figure 3.10 illustrates the rates and numbers of children and youth in care.

About one per cent of B.C.'s children age 18 years and under are cared for in foster homes or other non-parental care provided by MCFD. Studies conducted by MCFD indicate that 50 to 60 per cent of children taken into care are from families that have received income assistance within the previous year, showing the link between poverty and family instability. Sixty per cent were lone parent families. Forty per cent of children and youth in care are Aboriginals. Demographically, the provincial Aboriginal population is increasing and now makes 8 per cent of children (age 0 to 18 years). By 2005, MCFD aims to have 50 per cent of Aboriginal children who are in care served by delegated Aboriginal agencies and as many as possible placed with Aboriginal foster families.

Although returning children in care back to their original family is the most important and key goal of the ministry, for a small portion of children it may not be possible. For those in permanent care, successful adoption is preferred. Adoption will allow them to learn and grow in a stable family and cultivate a sense of belonging. The number of children and youth in care who are adopted is increasing. In 2001/02, 243 of these often hard-to-place children found a permanent home. The target is to raise that number to 300 children a year by 2005 (B.C. Ministry of Children and Family Development, 2003 October).

FIGURE 3.10

Children and youth in care, B.C., 1980 to 2005 (Target)



Source: B.C. Ministry of Children and Family Development. Population estimates from BC STATS, B.C. Ministry of Management Services.

Where Do We Go From Here?

Most British Columbians live in safe communities and receive strong social support from family, friends and co-workers. Many also do their part by giving back to their communities through donating money or time. These findings are consistent with our understanding of what makes people healthy when they live in a healthy community.

With crime rates falling our communities are becoming more secure. However, unstable or dysfunctional family functioning continues to disrupt a small proportion of children's lives, necessitating the child's removal from the home. While constituting just one per cent of the child population, children in care are disproportionately from single parent families on income assistance or from Aboriginal families. This points to the need for policies and initiatives to help these groups obtain more stable and nurturing family lives.

What Actions Can We Take?

Individuals:

- Encourage a climate of zero tolerance for violence in all areas of society.
- Participate in community decisions and activities.

Employers:

- Adopt policies that support employees' participation in voluntary activities.
- Support flexible work arrangements for employees.

Governments:

- Address the underlying factors that put people at risk of turning to crime and violence, including poverty, inadequate housing, inequality, racism, family breakdown, child abuse and neglect, school failure and unemployment.
- Improve services to support the safety of mothers, which in turn will support the safety of children.
- Provide funds for social development and outreach programs for groups that are isolated, disadvantaged or showing signs of distress.

Housing

The homes in which we live and the surrounding neighbourhood can influence our opportunities for work, recreation and social interaction. They can also affect our health and quality of life. Houses we live in keep us dry and sheltered. A damp or cold home or one that needs repair can contribute directly to disease or injury. If it is too small or overcrowded, it can contribute to family stress because there will be insufficient room for all family members.

What Do The Indicators Show?

- B.C. has the second highest rate of renters in Canada, after Quebec, with 30.9 per cent of households renting in B.C., pointing to the high cost of home ownership in the province.
- An estimated 130,000 people live at risk of homelessness in Greater Vancouver, living in unaffordable, inadequate dwellings and spending more than 50 per cent of their income on shelter. In a 24-hour snapshot census, 1,121 people in Greater Vancouver, including 71 children, were living on the street or in emergency shelters.

Housing Need

This indicator refers to the proportion of renter households that are unable to afford suitable and adequate housing. It is based on the Core Housing Need index developed by the Canadian Mortgage and Housing Corporation, using census data. Unfortunately, the data from the most recent census required for the calculation of the index are not yet available. Therefore, we cannot update this indicator. In the 1999 Annual Report we found that one in three renter households were unable to afford suitable and adequate housing.

However, we know that 30.9 per cent of B.C. households are renters. This is the second highest rate after Quebec (Lefebvre, 2002). According to a recent national study, the Survey of Household Spending (2000), the following are some findings about renters in the country:

- In general, renters spend about 28 per cent of their income on housing.
- Those in the lowest quintile of income, however, spend about 40 per cent of their income on housing.
- Low-income renters who live in subsidized housing spend a lower proportion (31 per cent) of their income on housing than do those in non-subsidized housing (48 per cent).
- Nineteen per cent of renters live in housing that is in need of repairs or unsuitable in size.

As a general rule, households are considered to have affordability problems if more than 30 per cent of household income is spent on housing costs. The 2001 update of the Survey of Household Spending found that shelter costs account for one-third of household spending in lowest-income households (Statistics Canada, *The Daily*, December 11, 2002). Households in these situations are quite likely to have insufficient money for other necessities such as food, clothing, and transportation. They may have to make difficult choices such as sacrificing food, working longer hours, or relying on food banks. These choices can lead to poorer health. In contrast, the same survey found the top 20 per cent of households by income only allocated 15 per cent of their budgets to shelter.

Homelessness

In the 1999 Annual Report, we noted that there were no reliable indicators to accurately measure the number of homeless people in B.C. This remains true today.

However, new research has given us better estimates, particularly for the Lower Mainland. In January 2001, a research project was launched by the Greater Vancouver Regional District and the Greater Vancouver Regional Steering Committee on Homelessness. The project's aims were to improve data and methodology to better estimate the number and needs of people who are homeless, develop a demographic profile, and improve data collection and methodology, all of which would be used to support a regional homelessness plan.

During one 24-hour period in January 2001, a snapshot survey was conducted to tally the number of homeless people in Greater Vancouver. A nighttime count was conducted of homeless people staying in 40 emergency shelters, transition and safe houses. During the day, counts were made at 45 locations where homeless people congregate, such as parks, bottle depots, meal programs and panhandling locations. People were screened to determine whether they had stayed in a shelter the previous night. In total, 1,121 homeless individuals were counted during the snapshot survey, including 71 children. This tally is thought to underestimate the number of homeless by perhaps 60 to 80 people for the time period.

The GVRD research project also estimated the number of people at risk of becoming homeless – those who spend more than 50 per cent of their income on shelter. The 2001 GVRD study, available on their Web site (www.gvrd.bc.ca/homelessness) estimated that by 1996, 131,000 individuals were at risk of homelessness, up from 80,000 in 1991. In terms of households, 58,000 in 1996 were at risk, up 48 per cent since 1991.

Researchers in this project also found that 66 per cent of homeless people report at least one health condition. Addiction, at 39 per cent, is the most commonly reported health issue. Twenty-three per cent reported a mental illness and 15 per cent reported a disability.

In April 2003, the British Columbia Homelessness and Health Research Network was established to promote a collaborative, multidisciplinary program of research on homelessness and health. Funded by the Canadian Institutes of Health Research, the network is based out of the Institute for Health Promotion Research at the University of British Columbia and includes a project team of research and community partners from around the province. This new group will establish more high-quality research and data about homelessness and health in B.C. Its Web site is found at http://bchhrn.ihpr.ubc.ca

Meanwhile, it is reported anecdotally that more people are living in emergency shelters, parkades, ravines and other temporary shelters in towns and cities around the province. Vancouver, Victoria, Prince George, Kelowna, and Nanaimo are some apparent examples. Strategies and programs to combat homelessness should take into account the gender differences among the homeless population. Some services, which have evolved to serve homeless men, are inappropriate for homeless girls and women.

Where Do We Go From Here?

We need to continue to take action to ensure housing continues to be a priority. The increased focus on research and data collection for homelessness is an important new trend that is applauded.

What Actions Can We Take?

Governments and community groups:

- Continue the focus on improved research and data collection to understand the full impact of housing need and homelessness in B.C.
- Recognize the importance of housing as a determinant of health for individuals and communities.
- Expand provincial and local efforts to help people with housing needs, especially the homeless, the mentally ill, people with addictions, single parents with children and people with special needs.

FOCUS ON SENIORS' LIVING AND WORKING CONDITIONS

Seniors, like other age groups, require favourable living and working conditions. How do B.C. seniors measure up against the first health goal?

Employment

- According to 2001 labour force statistics, five per cent of seniors (24,500) in British Columbia are employed and another 1,500 are looking for work. More male (6.8 per cent) than female seniors (3.3 per cent) and greater proportion of younger (10.3 per cent aged 65 to 69 years) than older seniors (2.6 per cent 70 years and older) are employed. More than half who are employed are in full-time jobs.
- Almost half of seniors who are working are self-employed. Highly educated Canadians are more likely than those with less schooling to continue working beyond retirement age (Duchesne, 2002). In B.C., 1.3 per cent of the workforce are seniors but among doctors, 6.8 per cent are seniors (Canadian Institute for Health Information, 2001).

Income

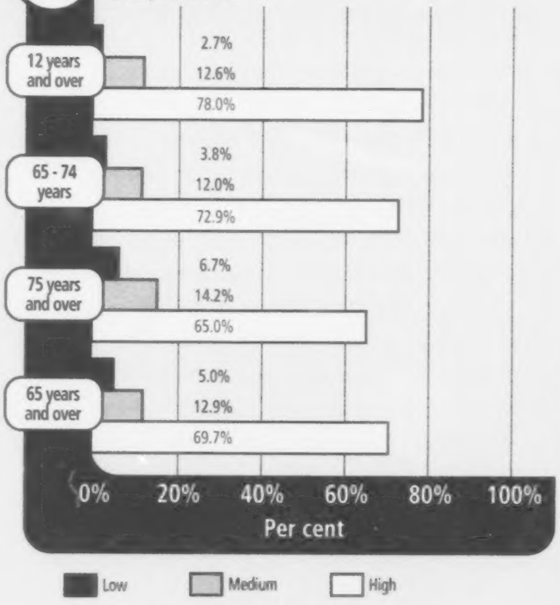
- Seniors are becoming wealthier. In 2001, just 9.4 per cent of B.C. seniors were considered to be persons in the LICO bracket, fewer than the general B.C. population (12.1 per cent). Elderly families in British Columbia, with the major income earner being 65 or older, had an average after-tax income of $42,536 in 2001. The average after-tax income for a B.C. family of two or more was $57,581 in the same year.
- The socio-economic status of seniors has been helped by income redistribution strategies such as employment pension plans, the Canada Pension Plan, private savings plans like the Registered Pension Plans and Registered Retirement Savings Plans, and public income assistance programs like the Old Age Security Program.
- Some segments of the seniors' population, such as single women living alone, have significantly lower levels of income. The average after tax income of unattached elderly B.C. females is only $21,017, one of the lowest of all family type categories (Statistics Canada, 2003 June).

Social Support and Participation

- According to the CCHS 2000/01, most B.C. seniors reported that they had someone to confide in (74.6 per cent), had someone who would give them advice about a crisis (70.8 per cent), had someone they can count on for advice (65.2 per cent) and someone who makes them feel loved and cared for (77.2 per cent). While seven out of 10 had medium or high levels of social support, this aggregate score is still slightly lower than the overall population (see Figure 3.11). The social support of marriage is associated with longer lives in senior men, but not in women, according to data from the NPHS.

FIGURE 3.11

Social support levels, Seniors and population age 12 years and over, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

FOCUS ON SENIORS' LIVING AND WORKING CONDITIONS (CONTINUED)

- More seniors than any other age groups volunteer for charitable and non-profit organizations, spending an average of 351 hours as volunteers in 2000. In the same year, the average donation from B.C. seniors was $224, just slightly below the average donation of $255 for all ages.

Crime

- Generally, seniors are less likely to be victims or perpetrators of crime compared to other age groups. However, seniors, especially females, often feel unsafe when walking in the dark or feel worried when at home alone (*A Portrait of Seniors in Canada*, 1999).

Housing

- Nationally, 70 per cent of seniors are home owners and 64 per cent are mortgage-free, the highest of any age group. Of the 30 per cent of seniors who rent, many spend a substantial amount on housing – 34 per cent of their income.
- B.C. has been shifting from a medical model of seniors' care to a social housing model of care with the aim to keep seniors independent in the community for as long as possible with community supports or assisted living rather than having to enter a care facility.

Seniors are performing well based on the measures in Goal 1. However, some seniors are isolated and alone with insufficient income or social support. These are often women who have outlived their male partners. The increasing age and ethnic diversity of our seniors, and the increasing numbers living in urban centres, highlights the necessity of creating and keeping policies and programs that help seniors stay socially connected, help identify seniors in need and help provide the assistance that keep them independent and healthy. We need to ensure that we can effectively communicate with seniors in culturally sensitive ways.

HEALTH GOAL 2

CHAPTER 4

Individual Capacities, Skills and Choices

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES

Healthy child development
Low birthweight – *Not much change*
Breastfeeding – *Improving*
Family functioning – *Not much change*
School readiness – *Improving*

Learning opportunities
High school graduation – *Improving*
Post-secondary education – *Improving*
Grade 12 exam completion rate – *Improving*

Healthy choices
Smoking – *Improving*
Heavy drinking – *Worsening*
Physical activity – *Not much change*
Healthy eating – *No trend data*
Bicycle helmet use – *No recent data*
High-risk sexual practices – *No recent data*
Teen pregnancy rate – *Improving*

Independent living
Living in the community, age 65 and over – *Not much change*

Opportunities for all individuals to develop and maintain the capacities and skills needed to thrive and meet life's challenges and to make choices that enhance health.

The choices we make in our lives have a potent influence on our health. Choosing to eat a healthy, nutritious diet, to drink alcohol responsibly, to remain physically active and to continue to engage one's mind with life-long learning can translate into a longer, healthier life. Likewise, the decision to smoke, drink to excess, use illegal drugs, have unsafe sex or remain sedentary can lead to a shorter life with more illness-filled years. However, the ability to make healthy choices often depends on underlying factors such as healthy child development in stable, functional families, which gives children the best start in life. Access to high-quality education helps build the skills and capacities to choose wisely and exercise autonomy throughout one's own life. The ability to be in charge of one's own life and remain independent, even if one is elderly or disabled, also translates into better health.

Health Goal 2 aims to establish opportunities for all individuals to develop and maintain the capacities and skills needed to thrive and meet life's challenges and to make choices that enhance health. Goal 2 focuses on the trends in the following categories through the various indicators:

- **Healthy child development:** low birthweight, breastfeeding, family functioning, school readiness.
- **Learning opportunities:** high school and post-secondary graduation, Grade 12 exam completion.
- **Healthy choices:** smoking, alcohol consumption, physical activity, healthy eating, bicycle helmet use, high risk sexual practices, teen pregnancy.
- **Independent living:** living arrangements for seniors, mentally ill and the disabled.

Healthy Child Development

The early years of life are critical to the future well-being of the child. As the First Ministers of Canada noted in September 2000, what happens from conception to age five establishes the foundation for competence and coping skills that will affect learning, behaviour and health for the rest of a child's life. According to the National Children's Agenda (1999), five predominant influences affect children's development:

- biological inheritance
- family
- child care and school
- physical and community environments
- society.

Generally, healthy children emerge most often from healthy families, and healthy families lead to healthy communities.

What Do The Indicators Show?

- The proportion of low birthweight babies born each year has remained relatively unchanged for the last two decades, but improvement can be made particularly in some sub-populations such as Aboriginal families.
- B.C. mothers still lead the country in the number breastfeeding their children, but the majority stop three to six months after the child's birth. Children can benefit from longer periods of breastfeeding. More can be done by society, employers and individuals to support women to continue breastfeeding for longer periods of time.
- The majority of families in B.C. still rank high on scales of family functioning. However, about 10 per cent of families emerge as being dysfunctional. The makeup of families is changing. While traditional "nuclear" families, consisting of a legally married mother and father raising a child or children together, are still the majority, increasingly more common are single parent families, common-law families, or families in which the parents separate or divorce while the children are still preschoolers.

Low Birthweight

Infant weight at birth tells us about the health of the child as well as the mother. Low birthweight – below 2,500 grams (5.5 lbs) – is a well-established indicator that is associated with a higher chance of death within the first year of life. Infants with low birthweight are also more likely to have birth defects, illnesses and/or poor health throughout childhood. In British Columbia, low birthweight rate has remained relatively unchanged in the last two decades. For 2002, 5.3 per cent of live births were of low birthweight (see Figure 4.1).

As we noted in the 1999 Annual Report, the Vancouver Health Service Delivery Area (HSDA) continues to have a greater

NATIONAL CHILDREN'S AGENDA

As we reported in the 1999 Annual Report, at the end of the 1990s, the federal, provincial and territorial government began to set out a shared vision to promote the health and wellness of Canada's children. Called the National Children's Agenda, it outlined values and goals as well as six policy areas in which governments could cooperate to better support children. One of the policy areas was early childhood development.

Early childhood development agreement
In September 2000, the federal government and all the provinces and territories (except Quebec) agreed to improve and expand the services and programs to young children in Canada. Under the agreement, all governments committed to producing annual reports to the public on progress among a common set of 11 indicators. The indicators measure the physical health, safety, security and early development of young children.

B.C. released its first baseline report under the agreement in January 2003, *Indicators of Early Childhood Health and Well-being in British Columbia*. The report uses the same data sources as this PHO report and echoes many of the same findings stated here.

An electronic copy of the indicators report is available from the B.C. Ministry of Children and Family Development Web site:
www.mcf.gov.bc.ca/publications/early_childhood.htm

prevalence of low birthweight infants than the provincial average for this indicator for all years, except 2001, during the period 1986 to 2002. Data for low birthweight is recorded by the mother's usual residence, so this higher prevalence is not a by-product of high risk mothers coming to Vancouver's tertiary hospitals to give birth. Instead, it is probably related to socio-economic factors, including low income, smoking by the mother during pregnancy, poor diet, pregnancy-induced hypertension, and multiple births. The trend of women postponing pregnancy until age 35 or older can also be a factor as these women are more likely to have pregnancy-induced hypertension and gestational diabetes.

Breastfeeding

Breastfeeding provides the essential nutrients for healthy infant growth and development and provides antibodies to protect against infection and allergies. Experts agree that human breast milk contains the optimal balance of nutrients needed for brain and body growth (McCain & Mustard, 1999). In addition, it also allows emotional bonding between mother and child, fostering positive child development.

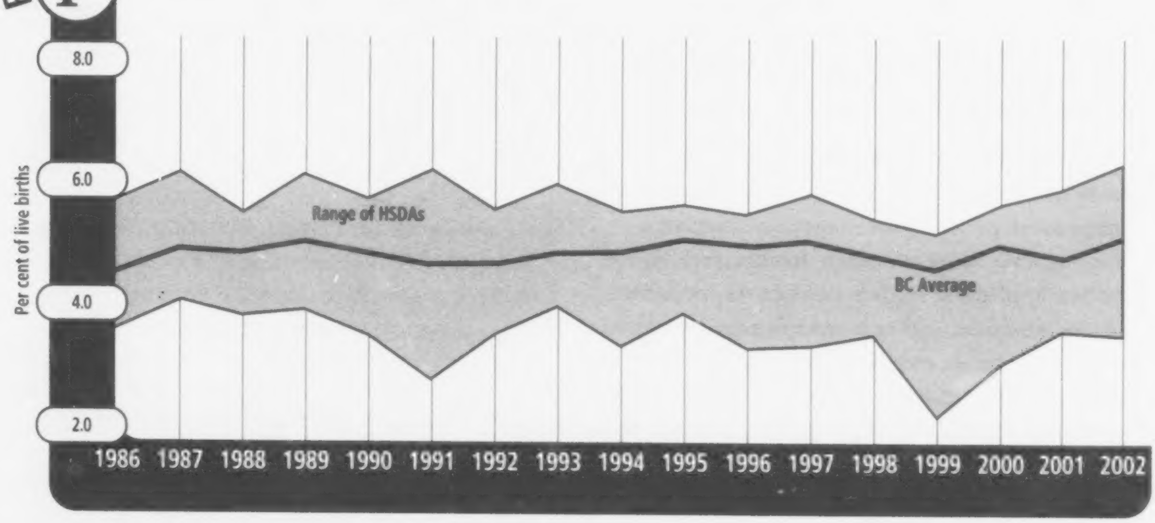
The vast majority of B.C. babies are now breastfed for at least a few weeks of life. The National Longitudinal Survey of Children and Youth (NLSCY) 1998/99 cycle found that 93.1 per cent of children aged 0 to 3 in B.C. were breastfed for at least some portion of life. This is substantially higher than the rest of Canada, where the same survey found 79.9 per cent of children aged 0 to 3 were breastfed. It also appears to be an improvement from the previous NLSCY data, which we reported in the 1999 Annual Report, that showed 88 per cent of infants were breastfed (although this survey just measured children aged 0 to 2).

Not all of these babies were breastfed for the recommended period of time, but the proportion is improving. According to the Canadian Community Health Survey 2000/01, of mothers who breastfed, 28 per cent stopped before three months, but 70 per cent breastfeed for at least three months or longer (see Figure 4.2). This is a greater number than reported in the National Longitudinal Survey of Children and Youth 1996/97, where only 46 per cent of mothers breastfed their last child for longer than 3 months.

Experts recommend that babies be exclusively breastfed for four to six months until solid food is introduced. Subsequently, breastfeeding can continue as part of the diet into the second year. This is where future improvement can come, particularly extending the length of feeding from three months to six months.

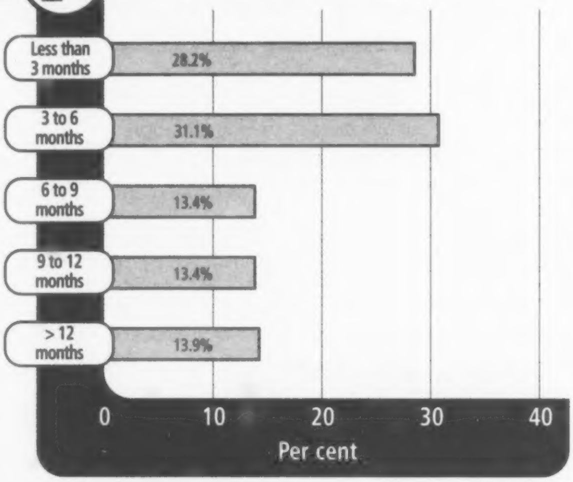
Returning to work and unsupportive environments for breastfeeding are some of the reasons women stop breastfeeding. Some public places, however, are becoming more baby and mother friendly. Allocated family rest areas that allow mother and

FIGURE 4.1 Low birthweight rate, B.C., 1986 to 2002



Source: B.C. Vital Statistic Agency, B.C. Ministry of Health planning

FIGURE 4.2 **Length of time breastfeeding, B.C. females who reported breastfeeding, 2000/01**



Source: Statistics Canada. Prepared using Share Files, (Community Health Survey, 2000/01). From Information Support, B.C. Ministry of Health Services.

child quiet space to breastfeed are more common. It is likely that more women might continue breastfeeding after six months if employment policies were more flexible or if a special room was set aside to enable nursing mothers to express milk at work.

Family Functioning

Family functioning has been described as "the way in which families work together on tasks that are necessary for the family unit to survive" (Racine & Boyle, 2002). A well-functioning family can effectively solve problems, communicate well with each other, and provide a stable, consistent home that is free of violence and abuse. A well-functioning family has positive interactions with each other and spends time playing and laughing together.

The National Longitudinal Study of Children and Youth, which has followed more than 15,000 children and youth in Canada since 1994, has been assessing family functioning by a series of questions that look at parenting style, communication patterns, involvement and behavioural control to arrive at a global scale of family functioning. According to the 1998/99 results of this study, the majority of B.C. families (89.4 per cent) are functioning adequately or well. About 10.6 per cent of families could be characterized as dysfunctional, which may cause future problems for children, particularly in forming healthy, respectful and meaningful relationships with others. The findings from 1998/99 are slightly lower than those reported in the 1999 Annual Report, down from 93 per cent in 1996/97. Nevertheless, about nine in 10 B.C. children live in families that are functioning well. They work together on tasks necessary for a family to survive – solving problems together, offering support to each other and communicating effectively as a unit.

The Canadian family, however, is changing. According to the report on *The Well-being of Canada's Young Children* (Human Resources Development Canada, 2002):

- Families are smaller: average size is 3.0 per family, more than 25 per cent of children are the only child in the family.
- Families are breaking up when children are younger: five times as many children in the late 1980s experienced parental separation before their sixth birthday as compared to children in the 1960s.
- More families are headed by a single parent than in the past: 13 per cent in 1991, up from 9.4 per cent in 1971.

While there are many happy and well-functioning single parent families, in general children from two-parent families report fewer problems than children from single parent families (see Figure 4.3). Absent parents and spouses, difficult divorces, lower incomes, all contribute to more challenges for single parent families. Difficulties range from school performance to emotional well-being (Human Resources Development Canada, 2002). Children from two-parent families were also less likely to be poor.

These difficulties highlight the need for supportive programs and policies such as universal access to childhood development programs and opportunities, availability of affordable housing, adequate incomes and childcare for single parent families, and support services for families in difficult transitions.

School Readiness

Most B.C. children start formal schooling between the ages of five and six. The school "readiness" of children age four to five is an indirect measurement of the quality of the early childhood development and experiences. Children who are ready for school have usually been exposed to books and numbers, have had positive social interactions with other children and adults, have developed social skills in a group setting, and have the physical, intellectual, emotional and behavioral maturity to begin a kindergarten or Grade 1 program. School readiness at age five prevalence of low birthweight infants than the provincial average for this indicator for all years, except 2001, during the period 1986 to 2002. Data for low birthweight is recorded by the mother's usual residence, so this higher prevalence is not a by-product of high risk mothers coming to Vancouver's tertiary hospitals to give birth. Instead, it is probably related to socio-economic factors, including low income, smoking by the mother during pregnancy, poor diet, pregnancy-induced hypertension, and multiple births. The trend of women postponing pregnancy until age 35 or older can also be a factor as these women are more likely to have pregnancy–induced hypertension and gestational diabetes.

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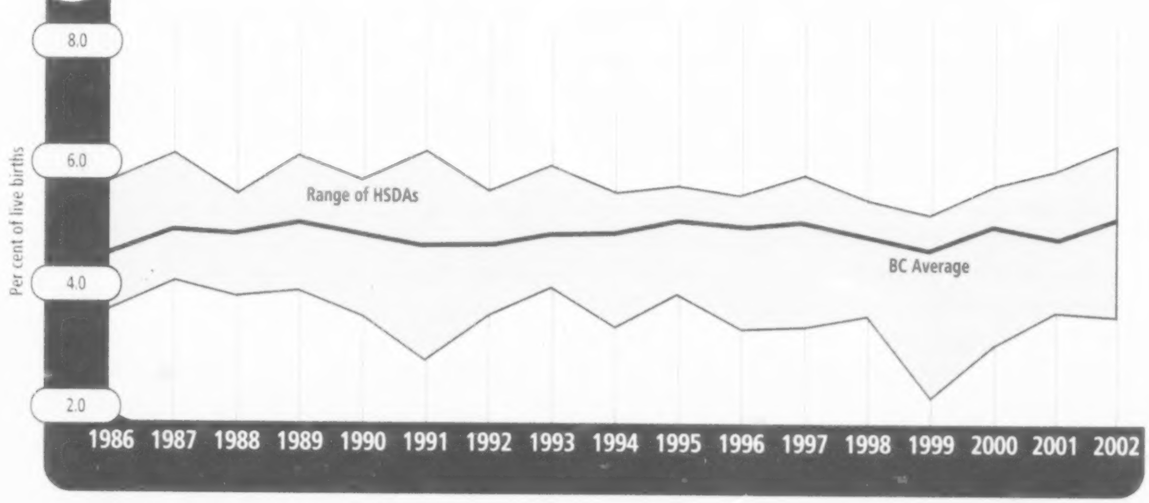

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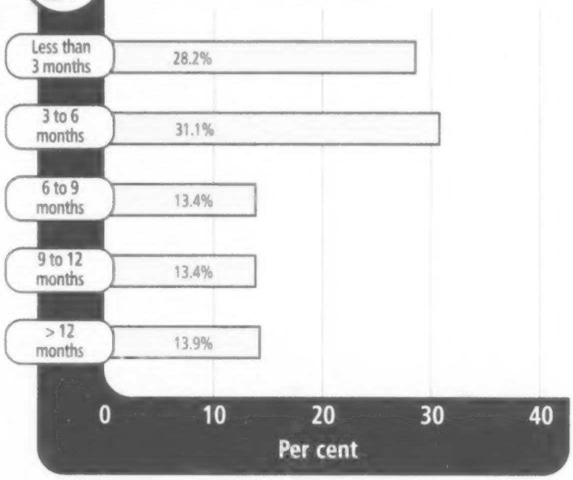

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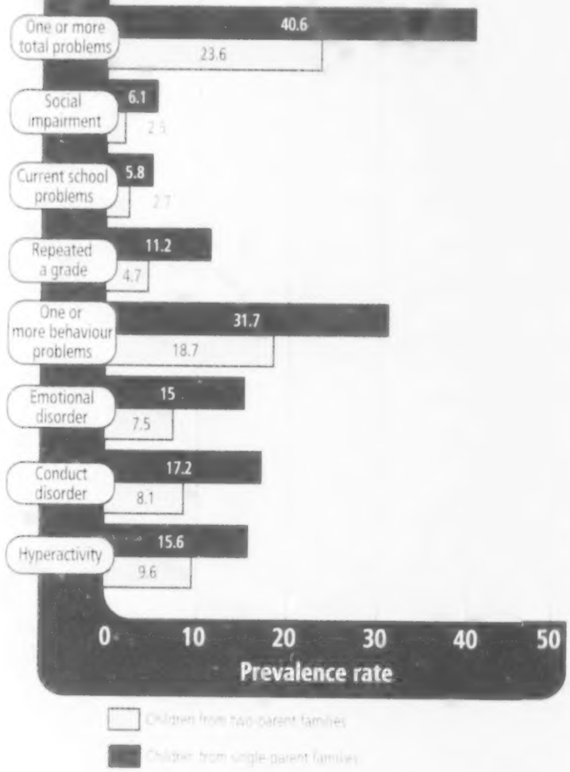
FIGURE 4.3

Rates of problems for children in single parent families, compared to children from two-parent families, Canada, 1998/99



Source: Human Resources Development of Canada. (2002). *Growing up in Canada: A detailed portrait of children and young people.* ON: Human resources Development of Canada and Statistics Canada. http://www.hrdc.gc.ca/sp-ps/arb-dgra/publications/books/class90/growing_up.shtml

translates into a positive attitude towards learning and school that can stay with the child throughout their years of education and contribute to better functioning and performance in school.

We can measure the readiness of four and five year olds for school by using the Peabody Picture Vocabulary Test. This test measures verbal ability and emotional and behavioural readiness.

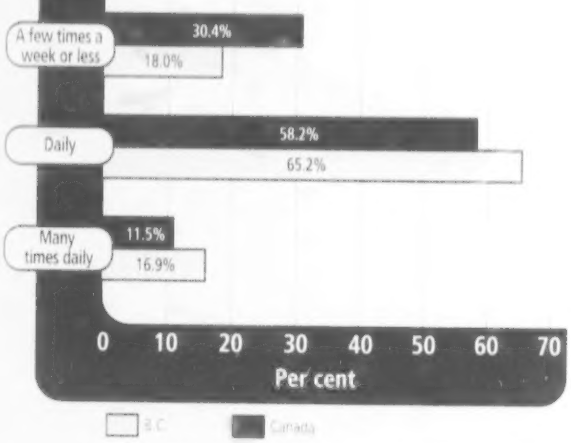
According to the National Longitudinal Survey of Children and Youth, the proportion of B.C. children who are considered ready has improved slightly from 81 per cent in 1994/95 to 83.7 per cent in 1998/99. In fact, 14.4 per cent are considered above average in their scores for the Peabody Picture Vocabulary Test.

Many factors have been associated with increased school readiness, including higher family income, higher level of education of the parents and positive parenting style. Frequent reading to young children is also positively associated with school readiness, a factor that may partially explain the slight increase. In 1998/99, 82.1 per cent of B.C. children (2 to 5 years of age) were read to at least once per day by their parent or another adult caregiver (see Figure 4.4) – significantly higher than the national average of 69.7 per cent for the same measure.

The parents' educational levels are also important in predicting a child's performance, even before they enter school. The mother's level of education was found to be the strongest predictor of a child's vocabulary ability prior to entering school, and of mathematics achievement at the elementary school level (Human Resources Development Canada, 2002).

FIGURE 4.4

Frequency children (2 to 5 years) are read to, B.C. and Canada, 1998/99



Source: Statistics Canada. National Longitudinal Survey of Children and Youth 1998/99. Data prepared by B.C. Ministry of Children and Family Development. (2003, January). *Additional indicators on early childhood health and well-being: An addendum to Measuring Success.*
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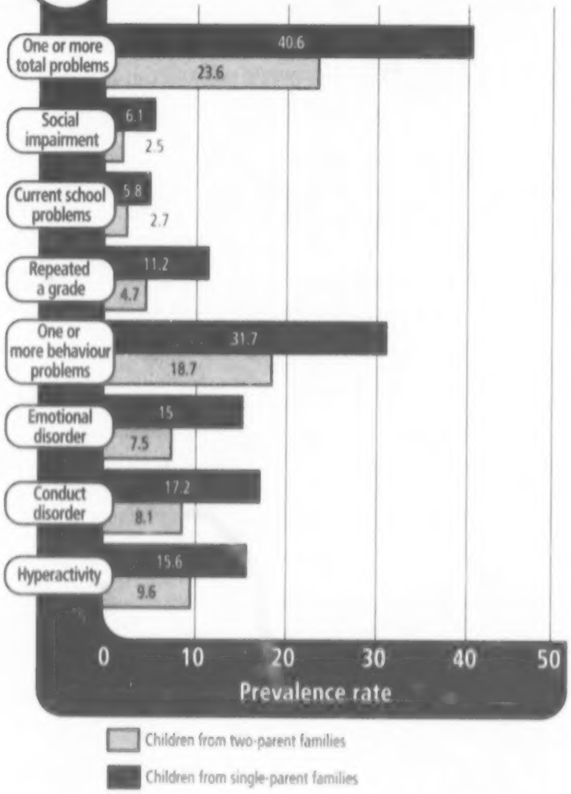

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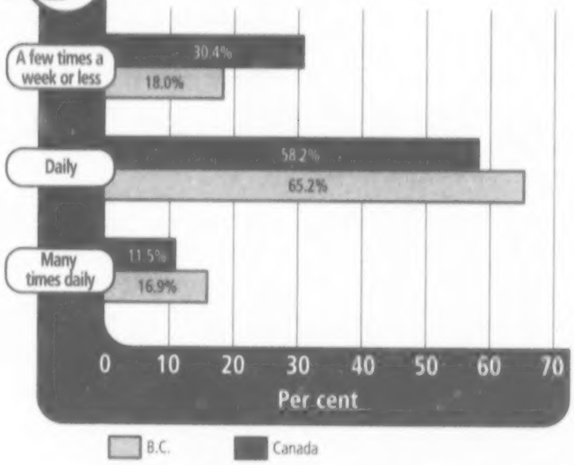


Source: Statistics Canada. National Longitudinal Survey of Children and Youth 1998/99. Data prepared by B.C. Ministry of Children and Family Development. (2003, January). *Additional indicators on early childhood health and well-being: An addendum to Measuring Success.* http://www.mcf.gov.bc/publications/measure_success/ecd_for_ms02.pdf

Where Do We Go From Here?

B.C. is doing well in relation to the rest of Canada on measures of early childhood development, but there is room for even more improvement, particularly in healthy birthweights, breastfeeding and family functioning.

Finland, Sweden and Ireland are some of the countries with the lowest rates in low birthweight babies and B.C. should be able to achieve similar rates. In fact, in East Kootenay HSDA, the low birthweight rate has consistently been low, averaging 3.4 per cent in the last few years (annual average 1998 to 2002). We can look to this HSDA as an achievable target for the province.

Our target is to have 80 per cent of all babies exclusively breastfed for the first four to six months of life. Although we are not meeting our target yet, of those mothers who do breastfeed, seven out of 10 breastfeed for at least three months or longer.

Family functioning is a fairly new indicator and therefore no target was set in the 1999 Annual Report. However, the decreasing proportion of B.C. families scoring well on this indicator and the changing face of the family unit means we must be cognizant that some families are at high risk. For example, some families headed by single mothers should be targeted for social and financial supports.

Although no targets were set for school readiness, our four and five year olds are showing more readiness to learn than previous cohorts. This is due in part to being read to by their parents more frequently. In fact, according to the Canadian Council on Social Development (2000), parents with low incomes read to their young children as often as parents in other income groups.

What Actions Can We Take?

The actions that we recommended in the 1999 Annual Report are still as relevant today.

Parents and caregivers:

- Breastfeed your children where possible for at least six months.
- Be warm and responsive to children by talking, singing and reading to your children regularly.
- Recognize that each child is unique.
- Choose quality child care and stay actively involved in your child's life.

Employers:

- Promote family-friendly workplace policies that allow parents to spend time with their children and provide a quiet private location for working mothers to breastfeed or express breast milk at work.

Governments and organizations:

- Make high-quality child care and other early childhood services accessible to all children, regardless of income background.
- Provide targeted programs for children living in disadvantaged families and neighbourhoods.
- Address the needs of young children in a coordinated, comprehensive manner, so that children and families do not "fall through the cracks".
- Provide prenatal outreach services to women at risk of having low birthweight babies and other poor pregnancy outcomes.
- Encourage all maternity hospitals to follow international guidelines for breastfeeding and to work towards achieving Baby-Friendly designation.
- Establish programs to set comprehensive assessment points in the early childhood period by routinely assessing all children for school readiness and making parents aware of good care in early childhood.
- Tackle larger issues that affect children's health and development – poverty, hunger, security, and social conditions of disadvantaged groups.

Learning Opportunities

Research repeatedly shows that education is one of the most important determinants of health. In general, the higher the level of education, the better the health. In this section, we will discuss the educational level of B.C.'s population in general, as well as how the student population has been performing.

What Do The Indicators Show?

- More working age British Columbians (25 to 64 years) than ever have graduated from high school – up to 80.6 per cent of the population in 2001 from 73.4 per cent in 1991.
- During the 1990s, B.C. experienced a huge growth in the population of working-age people with university degrees – up 62 per cent for men and 91 per cent for women. In 2001, 24 per cent of the entire working population had university degrees.
- Among recent high school students, fewer teens are dropping out and more are passing high school Grade 12 exams, up to 77.0 per cent in 2001/02 from 74.8 per cent in 1999/2000.
- Adults who return to school to acquire high-school equivalency are also passing Grade 12 exams at a much higher rate. In 2001/02, 59.7 per cent of adults passed Grade 12 exams, compared to only 24.4 per cent in 1996/97.
- The majority of students in Grades 4, 7, and 10 who take the mandatory Provincial Foundations Skills Assessment tests are meeting expectations in reading comprehension, writing and numeracy.

High School And Post-Secondary Graduation

British Columbians, like other Canadians, are better educated than ever. In fact, according to 2001 Census, B.C. had the highest-educated working-age population among all the provinces (Statistics Canada, *2001 Census*, March 11, 2003).

The decade from 1991 to 2001 saw great improvements in education attainment. By 2001, 80.6 per cent of all working-age (25 to 64 years) British Columbians had at least completed high school. This compares favorably with the 1991 Census count where only 73.4 per cent had a high school diploma. Of 1.2 million working people aged 25 to 64 in 2001, 56.4 per cent had graduated from a trade school, college or university, up from 46.9 per cent in 1991.

FIFTY YEARS OF HIGHER EDUCATION

Between 1951 and 2001, a massive shift towards higher education occurred in Canada.

According to Statistics Canada, in 1951, only two per cent of Canadians had education beyond high school but by 2001, for the first time, 51 per cent did; 36 per cent of those were trade and college degrees while 15 per cent were university degrees.

Part of the huge growth in educated Canadians came through immigration policies in the 1990s, bringing 61 per cent of immigrants with post-secondary degrees to Canada compared to 48 per cent in the two decades before. Another factor was the recession of the 1990s, which had more young adults staying in university rather than entering the job market.

As a result in 2001, 28 per cent of Canadians age 25 to 34 had university degrees and 21 per cent had college diplomas.

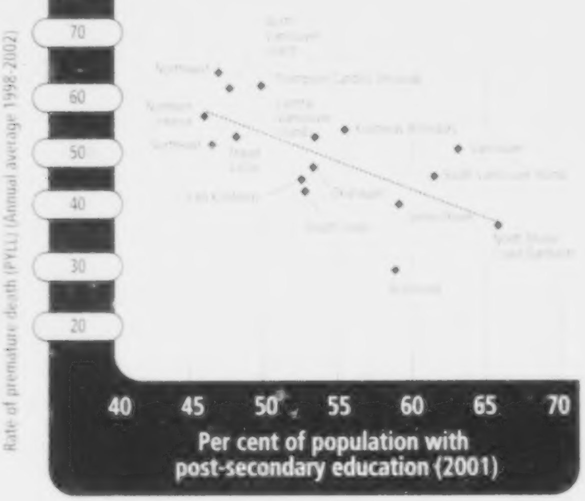
On the world stage, Canada now ranks fourth overall for the proportion of the population with university degrees, after the U.S., Norway and the Netherlands. (Statistics Canada, *2001 Census*, March 11, 2003).

B.C. women experienced greater gains in attainment of university qualification than the province's men during the decade. Not only are there more working-age women (263,240) than men (249,475) with university degrees, the growth in university education attainment in the last decade is also greater for women (91 per cent) than men (62 per cent).

Figure 4.5 shows that regions that have higher proportions of the population with post-secondary education, such as North Shore and Vancouver, tend to have lower rates of premature deaths (as measured by potential years of life lost). Those in the northern regions of B.C., where proportions of the population with post-secondary education are lower, tended to have higher premature death rates.

FIGURE 4.5

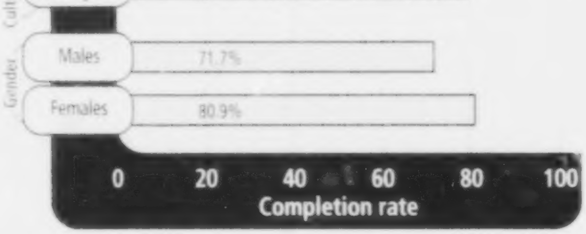
Relationship between education and health, B.C. Health Service Delivery Areas



Source: Education – per cent of population age 25 to 64 years with a post-secondary education: Statistics Canada, 2001 Census. Data prepared by BC STATS, B.C. Ministry of Management Services. Health – PYLL is expressed as a rate per 1,000 standard population (1998-2002 annual average): B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. Unpublished tables.

FIGURE 4.6

Grade 12 completion rates, Selected Groups, B.C., 2001/02



Note: Data excludes students from independent schools.
Source: Data Analysis and Reporting, B.C. Ministry of Education. Unpublished Tables.

Grade 12 Exam Completion

Recent high school students are doing better, with more successfully completing Grade 12. For those who took the Grade 12 examinations, 77.0 per cent (includes all schools) successfully passed in 2001/02. This is an increase from 74.8 per cent in 1999/2000.

As in most years, more females than males and more non-Aboriginals than Aboriginals are completing Grade 12. There was also considerable regional variation. Grade 12 exam completion rates were as low as 33.9 per cent in Stikine and as high as 88.7 per cent in West Vancouver. Figure 4.6 shows the completion rates for selected groups in 2001/02.

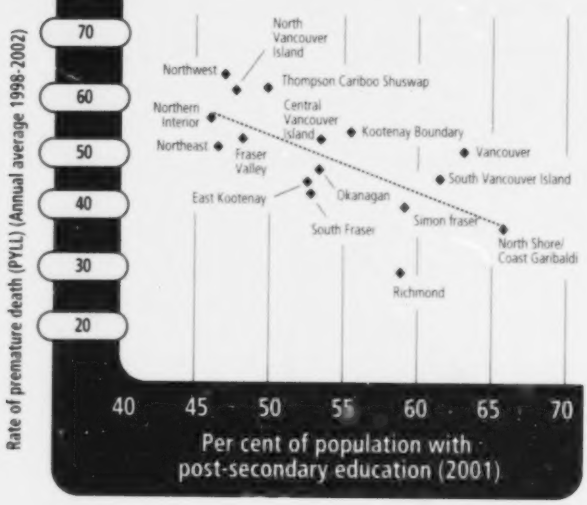
Other student learning measures also show positive signs:

- **Adults** – those who lack a high school degree tend to perform more poorly on simple daily literacy tasks and also tend to have lower earning power. It is encouraging to know that 59.7 per cent of continuing education students, primarily adults returning for certification, are also passing Grade 12 examinations. This is significantly higher than six years ago, when completion rate for the same group was only 24.4 per cent. This is consistent with findings at the national level. The 2001 Census revealed that a greater proportion of adults, age 20 to 34 years, are making a greater commitment to full-time education at all levels – high school, trade, college or university.
- **Grades 4, 7, and 10** – Results from the Foundation Skills Assessment (FSA) are also encouraging. The FSA tests are mandatory provincial tests designed to gauge how well students in general are doing in B.C. schools. They measure student reading, numeracy and writing abilities during the milestone years of grades 4, 7 and 10. In 2002, between 70 to 95 per cent of students in all three grades met or exceeded expectations in all three testing areas. While reading comprehension and writing showed relatively consistent results over the last three years of tests, numeracy scores have improved. Now higher proportions of students in all three grades have met or exceeded targets set by the B.C. Ministry of Education in 2000/01.

Education is a key determinant of better health and it is encouraging that both student and adult populations are showing positive trends. Learning is a life-long enterprise and increasingly there is greater acceptance and opportunities for adults who want to go back to school. Regardless of the time of life, more education and training can translate into more control and options in one's life, and potentially better overall health.

FIGURE 4.5

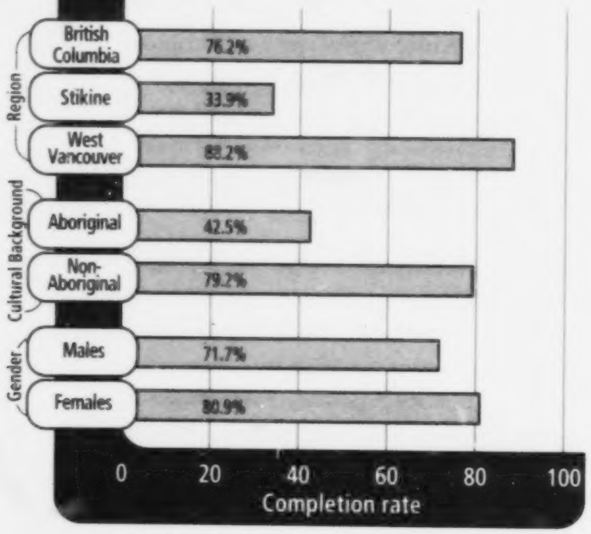
Relationship between education and health, B.C. Health Service Delivery Areas



Source: Education - per cent of population age 25 to 64 years with a post-seconday education. Statistics Canada. 2001 Census. Data prepared by BC STATS, B.C. Ministry of Management Services. Health - PYLL is expressed as a rate per 1,000 standard population (1998-2002 annual average). B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. Unpublished tables.

FIGURE 4.6

Grade 12 completion rates, Selected Groups, B.C., 2001/02



Note: Data excludes students from independent schools.
Source: Data Analysis and Reporting, B.C. Ministry of Education. Unpublished Tables.

Grade 12 Exam Completion

Recent high school students are doing better, with more successfully completing Grade 12. For those who took the Grade 12 examinations, 77.0 per cent (includes all schools) successfully passed in 2001/02. This is an increase from 74.8 per cent in 1999/2000.

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Where Do We Go From Here?

With B.C. now leading the country with the highest educated working-age population, we are progressing in the right direction. Nevertheless, it is important that we continually strive for a more educated population and ensure that opportunities for education are equitable and available for all. An educated, healthy population has value in itself and will enable B.C. to compete in the global economy.

Both B.C. Ministries of Education and Advanced Education have set achievement targets up to 2005/06. Using 2001/02 provincial rates as baseline measures, they aim to improve them yearly. In post-secondary education, for example, the target is an increase of one per cent in graduation rate each year. Although not explicitly addressed in setting their targets, there is recognition that some groups would require more attention, particularly aboriginal populations, children with special needs and Asian immigrants.

What Actions Can We Take?

The actions recommended in the 1999 Annual Report still hold true:

Parents and caregivers:

- Talk to children about what goes on in school and help them develop positive attitudes towards learning.
- Take an active role in improving the education system by participating in school activities, parent advisory councils and other functions, such as school accreditation teams.

Employers:

- Develop an organizational culture committed to learning and support employees who want to upgrade and/or attain certificates of education.
- Recognize women's greater share of family responsibilities and create a supportive workplace that will allow women to pursue life-long learning opportunities and/or allow men to take on more family responsibility.

School system:

- Provide programs and support that help young people stay in school.
- Provide opportunities for life-long learning.
- Investigate successful educational methods from other provinces and countries.
- Encourage parents and communities to be involved in schools and issues affecting the educational system.
- Monitor and report on student outcomes and performance for all students including disadvantaged students and students in targeted programs.
- Keep tuition rates for post-secondary education affordable for the majority of the population.

Healthy Choices

Many diseases and injuries can be prevented if individuals make healthy choices. Not smoking at all, drinking responsibly, practicing safe sex and wearing protective gear during leisure activities are choices that lead to reduced risk of illness and injury.

Our ability to adopt healthy behaviours, however, is influenced by our environment and our life circumstances. The addictiveness of tobacco, for example, makes it difficult to stop even for those desperate to quit. Eating nutritious food is dependent on access to high quality, wholesome foods and sufficient income. Risky choices – such as driving dangerously, using drugs or drinking irresponsibly, or having unsafe sex – are often celebrated on television or films or affected by peer pressure. Some women and men are in relationships in which it is difficult or impossible to negotiate safe sex. The objective of Goal 2 is to create conditions that help people make informed healthy choices while balancing the individual's need for freedom in making these choices.

What Do The Indicators Show?

- B.C. continues to have the lowest number of smokers in the country (20.5 per cent), including the lowest percentage of teen smokers (16.5 per cent). However, the devastating health consequences of smoking mean we must do more to prevent people from starting in the first place or to help them quit once they start.

- More people in B.C. are engaging in heavy drinking (measured as more than five drinks in a sitting 12 or more times a year). Heavy drinking has risen from 14.2 per cent of the population in 1994/95 up to 19.5 per cent of the B.C. population in 2000/01. Fetal Alcohol Spectrum Disorder (also known as Fetal Alcohol Syndrome) has also increased over the last decade. Recent changes to liquor laws in B.C. should be evaluated for their impact on the health consequences of alcohol consumption.

- B.C. has the most physically active population in Canada, but this percentage has not changed much over a decade. A full 50 per cent of the population is inactive or sedentary; therefore there is much room for improvement.

- Only four in 10 British Columbians ate fruit and vegetables five or more times per day, according to the CCHS 2000/01. Trend data are not yet available, but this indicator shows room for improvement.

- The majority of British Columbians wear a bicycle helmet when cycling, with the highest compliance in urban centres. Bicycle injury rates might be further reduced by policies and city design that create safe bicycle paths.

- No new data is available about high-risk sexual practices or teen sexual activity for the last three years. The 1999 Annual Report found that a significant number of individuals were not using condoms in new relationships, however, slightly fewer teens were becoming sexually active before age 19.

- Pregnancy rates among younger teens are close to the provincial target of 20 per 1,000 females but among older teens (age 18 to 19 years) are still too high at 56.5 per 1,000 females. British Columbia can achieve even lower rates along the lines of some European countries such as the Netherlands (8.7 per 1,000 females) by adopting messages that stress being healthy and responsible about sexuality.

Smoking

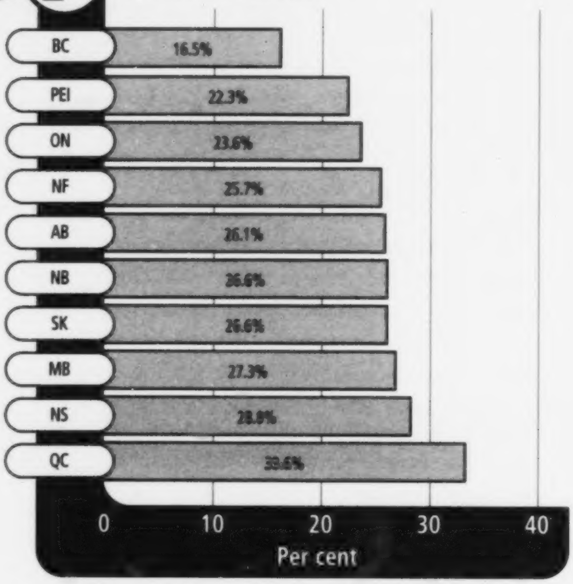
According to data from the Canadian Community Health Survey (CCHS) 2000/01, only 20.5 per cent of the B.C. population age 12 and over are current smokers. This is a notable drop from 25.8 per cent in 1994/95. Government policies, such as restricting sales to minors, raising tobacco taxes, requiring health warnings on tobacco packaging, and placing restrictions on advertising tobacco products, have helped to deliver the message that smoking is bad for our health and to reduce the smoking rate.

The proportion of former smokers continues to increase – a natural trend to expect as proportion of current smokers decrease. Data at the national level show that concern for their future health is the main reason many former smokers have quit their habit. According to the B.C. Doctors' Stop-smoking Program, willingness to quit is low among existing smokers, with fewer than 20 per cent of B.C. smokers indicating that they are ready to quit.

Although 5.9 million people in the country reported that they had quit, quitting is not an easy task (Health Canada, 2002 November). Many quitters make several attempts. In Chapter 6, Goal 4 we discuss smoking prevention and cessation programs in more detail.

B.C. has the lowest rate of teen smokers age 15 to 19 of any other province in Canada, according to the CCHS 2000/01. Only 16.5 per cent of B.C. teens smoke, compared to 22.3 per cent in Prince Edward Island and up to 33.6 per cent in Quebec (see Figure 4.7). Quitting is also a difficult task for teens. Half of B.C. teen smokers made one to three attempts to quit in the past 12 months. Nationally, only 18 per cent of teens successfully quit the habit. And according to the Canadian Tobacco Use Monitoring Survey (February to December 2001), the rate of quitting increases with age. Since quitting smoking is very difficult, more effort must be made to ensure teens never start smoking in the first place.

FIGURE 4.7 Current smokers, Age 15 to 19 years, by Province, 2000/01



Source: Statistics Canada. Canadian Community Health Survey, 2000/01. Prepared using CANSIM II (2002 October), http://statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

Regular Heavy Drinking

Alcohol, when used responsibly, can be an enjoyable part of the lives of many people without demonstrable harm. New research is showing that moderate drinking in certain age groups – a glass of wine a day for women and two for men – can provide positive health benefits, such as reducing heart disease in people older than age 40. The benefits of regular moderate drinking, however, are limited to older individuals. Increased consumption by younger drinkers whose habits and patterns of drinking are less likely to be moderate could result in the harms of drinking outweighing any benefits. The indication that binge drinking in young people is increasing, is therefore of concern.

CHANGES TO LIQUOR LAWS NEED PUBLIC HEALTH EVALUATION

In the spring of 2002, the B.C. government liberalized alcohol sales in the province. In a May 2002 report, the PHO expressed concern over the potential increase in alcohol abuse and recommended the changes be accompanied by:

- **Monitoring the public health and safety impacts, i.e. motor vehicle crashes;**
- **Increased prevention programming for alcohol abuse;**
- **Rigorous enforcement and monitoring to prevent sales to underage and intoxicated customers;**
- **More addiction treatment and rehabilitation and;**
- **Involvement of public health experts in future changes to alcohol policy.**

See http://www.healthplanning.gov.bc.ca/pho/pdf/alcoholpolicy.pdf

About four in 10 British Columbians aged 12 and over described themselves as regular drinkers in 2000/01. This means in the last year, they had an alcoholic drink at least once a month. However, a greater proportion of this group engaged in heavy drinking. The rate of drinkers having five or more drinks on one occasion, twelve or more times a year, rose from 14.2 per cent in 1994/95 to 19.5 per cent in 2000/01.

Excess alcohol consumption can harm the body directly (for example, liver disease or alcoholic psychoses) or can adversely affect behaviour. In 2002, 315 deaths in B.C. were directly related to alcohol. Another 1,503 deaths were indirectly related to alcohol. Three-quarters of alcohol related deaths occurred to people less than 75 years of age (B.C. Vital Statistics Agency, unpublished table, 2003).

Traffic collision statistics for 2001 show that alcohol was involved in 10.5 per cent (1,971) of all police attended injury collisions and 30.9 per cent (114) of all reported fatal collisions (Insurance Corporation of British Columbia, 2001). The hours between 9 p.m. and 3 a.m. are the peak times for alcohol-related collisions. More than half of all collisions occur on Fridays, Saturdays or Sundays between 9 p.m. and 3 a.m. (see Figure 4.8).

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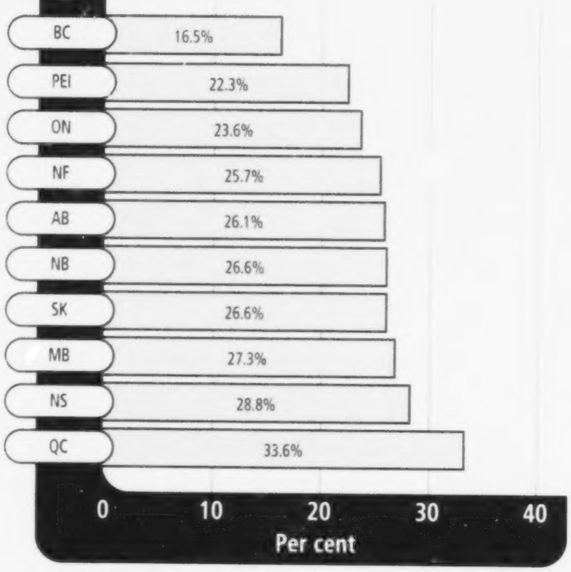

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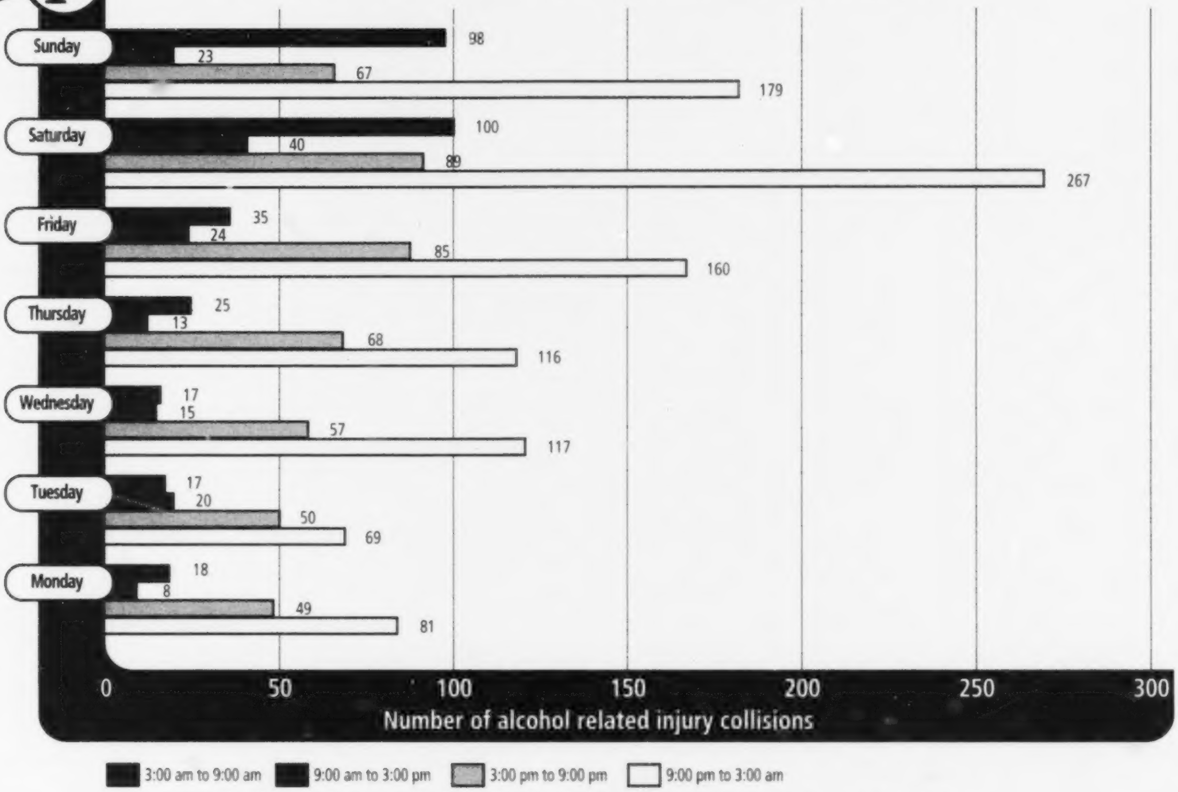
FIGURE 4.8 Number of alcohol related injury collisions by collision hour, Mondays to Sundays, B.C., 2001



Source: Insurance Corporation of British Columbia. (2001). *Traffic Collision Statistics: Police-attended injury and fatal collisions.* http://www.icbc.com/Library/research_papers/Traffic/B.C%20Traffic%20Collision%20Statistics%202001.pdf#

Besides poorer health and increased motor vehicle collisions, alcohol abuse can lead to a range of work, family, and social problems. The Police Services Division reported that alcohol was involved in 50 per cent of domestic assaults (see Goal 6 on domestic assault).

Alcohol can have devastating effects on unborn children. According to the *Health Status Registry Report*, between 1996 and 2000, at least 713 babies were born in B.C. with Fetal Alcohol Spectrum Disorder (FASD), an increase over previous years. The actual number is likely greater, but due to under-reporting or delayed diagnosis the exact number is unknown. FASD is caused by excessive alcohol consumption by the mother during pregnancy and results in children with permanent physical, mental and emotional disabilities (see box).

FASD'S DEVASTATING TOLL

Drinking during pregnancy can cause life-long physical and facial deformity for the affected child as well as mental handicap and emotional and behavioral problems. As many as 5 in 1,000 births may be affected by Fetal Alcohol Spectrum Disorder. However, provincial reporting and diagnosis has been inconsistent in the past. Medical professionals, with assistance from the Health Status Registry, are working to produce guidelines for assessment and diagnosis of FASD.

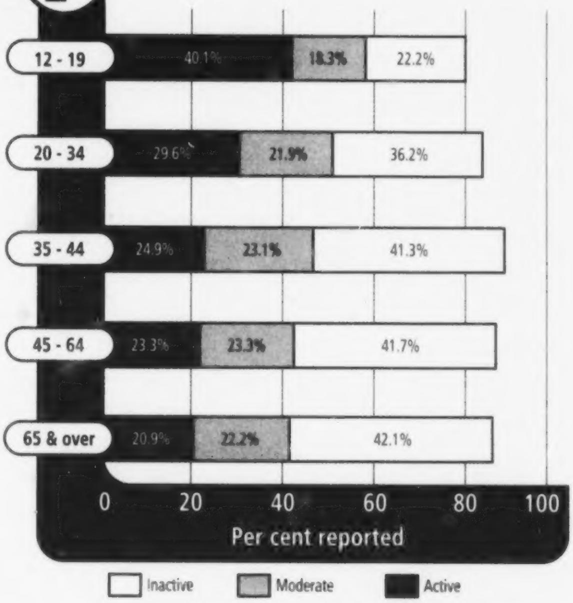
Responsible drinking means knowing and respecting your limits, never driving drunk, and drinking moderately. It means planning ahead for alternate transportation or appointing a designated driver when attending an event where alcohol will be served. Although denial of the problem is a hallmark of people who drink to excess, individuals must be encouraged to seek help if drinking is causing them or others harm, such as when excess drinking precedes violent behaviour.

Physical Activity

Physical activity is an essential component of a healthy lifestyle that can help delay or prevent many serious illnesses and conditions, improve sleep and energy levels, reduce excess weight, and help alleviate stress, anxiety and mild depression. Moreover, it can be a fun, enjoyable and fulfilling way to interact with family and friends. However, many British Columbians seem to consider physical activity an unpleasant chore.

Based on responses to questions about frequency, duration and intensity of their participation in leisure time activity (National Population Health Survey and Canadian Community Health Survey), the proportion of British Columbians age 12 and over who are considered physically active has not changed since 1995/96. In 2000/01, just 26.9 per cent are considered physically active and another 22 per cent moderately active. This means a full 50 per cent of British Columbians are inactive. It is assumed that people 65 and older would be less physically active, however, there is little difference in the activity level of the B.C. population between the ages of 45 to 65 (41.7 per cent) and those over 65 (42.1 per cent) who are considered inactive (see Figure 4.9). These are essentially the same findings as the 1999 Annual Report.

FIGURE 4.9 Physical activity by age groups, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey, 2000/01. Prepared using CANSIM II (2002 December), http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

Healthy Eating

Healthy living means healthy eating. The Canada's Food Guide to Healthy Eating recommends five to 10 servings of fruits and vegetables each day. Fruits and vegetables are high in vitamins, fibre and antioxidants, and when eaten along with a low fat diet have been shown to reduce the risk of certain cancers and heart

NEW PROGRAM PROMOTES PHYSICAL ACTIVITY AMONG B.C. SCHOOL CHILDREN

More than 50 per cent of B.C. children are not physically active enough to benefit their health. Now a new program, funded by the B.C. Ministry of Health Planning, is working with university researchers, educators, health professionals, and sports and recreation professionals to integrate physical activity into a wide range of school activities and curriculum, not just traditional physical education classes.

The Action Schools! program has two phases. The first phase, from February 2003 to June 2004, is a pilot project targetting Grade 4 and 5 students at 10 pilot schools in Richmond and Vancouver. Action Schools! focuses on four themes: healthy heart, healthy bones, healthy self, and healthy school. It includes both educational instruction and physical activities under those themes.

The pilot will develop curriculum and evaluate the outcome among the children – including measuring children's changes in bone health and heart functioning. Results will be compared to regular school physical education programs.

All schools will be invited to participate if the 2004 evaluation shows effectiveness.

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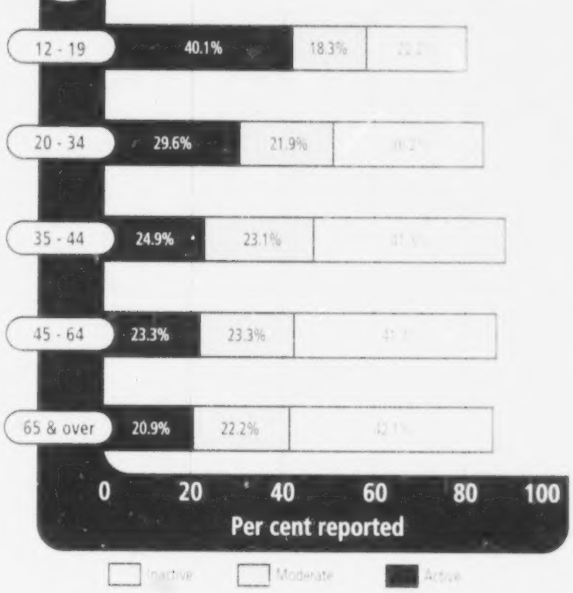

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NEW B.C. STUDY SHEDS LIGHT ON WEIGHT, EXERCISE AND EATING HABITS

The B.C. Nutrition Survey (BCNS) surveyed 1,823 people in the province aged 19 to 84 in 1999 to obtain the most comprehensive information on eating habits, body weight and exercise. Conducted by Health Canada, the B.C. Ministry of Health Planning and the University of British Columbia, the study included 90 minute in-home interviews by trained public health nurses and nutritionists and included measuring the height, weight and waist circumference of participants.

It found:

- 55 per cent of participants were overweight or obese based on researchers' measurements.
- 61 per cent did no strenuous exercise and 36 per cent did no moderate exercise.
- "Lack of time" was the most frequent reason for not doing more physical activity.
- Despite these findings, 80 per cent believed they were getting enough activity from their lifestyle.

The researchers noted that public health programs designed to increase lifestyle physical activity may have limited impact because most British Columbians believe they are already physically active (B.C. Ministry of Health Planning, 2003).

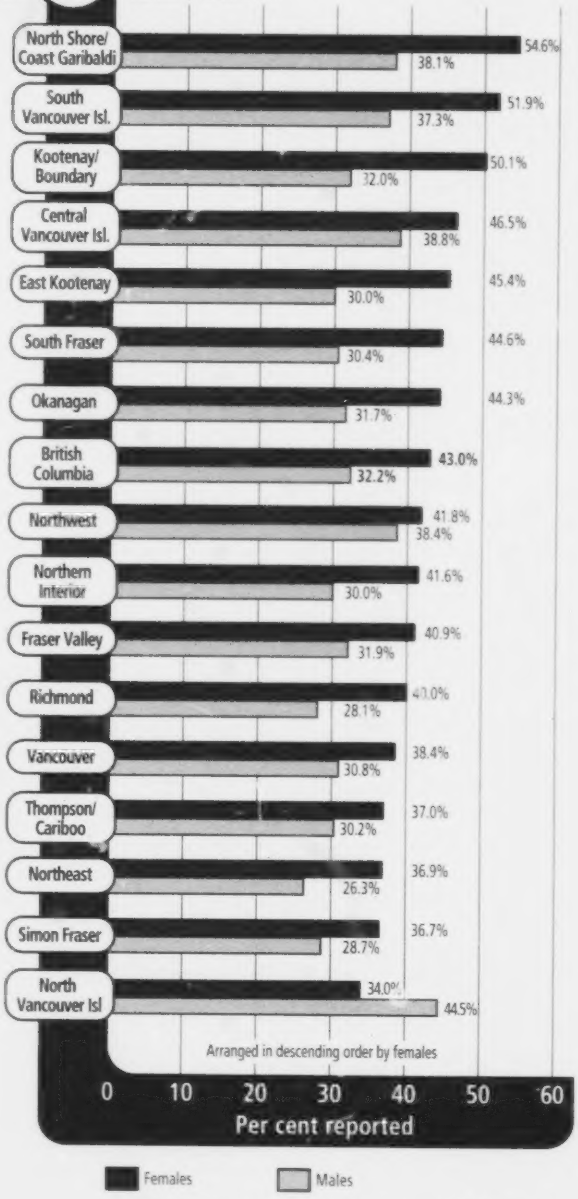
disease. High-fat, high-calorie diets usually result in excess weight gain, which is linked to chronic diseases such as adult-onset diabetes and heart disease.

In the Canadian Community Health Survey 2000/01, just 37.7 per cent of British Columbians consume fruits and vegetables at least five or more times per day. This is a newly available indicator and as yet, no trend data is available.

Dietary practices between males and females differ. There are also differences in dietary practices between regions of the province. A review of B.C. data shows that females are more likely than males to eat the recommended amount of fruits and vegetables. On the average, 43 per cent of B.C. females consume fruits and vegetables five or more times daily. Fewer B.C. males

FIGURE 4.10

Consume fruits and vegetables 5 or more times per day, B.C. Health Service Delivery Areas, 2000/01



Note: Health eating as measured by the consumption of fruits and vegetables 5 or more times per day.
Source: Statistics Canada. Canadian Community Health Survey, 2000/01. Prepared using CANSIM II (2002 October), http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

consume fruits and vegetables that frequently (32.2 per cent). This was true for all HSDAs except in North Vancouver Island HSDA, where males more often than females ate more fruits and vegetables. The highest consumption of fruits and vegetables among women was in the North Shore/Coast Garibaldi HSDA (see Figure 4.10).

People who eat a healthy diet are more likely to make wise choices in other areas of their life, tending to be more physically active, less likely to smoke and more likely to drink responsibly. There is also a strong relationship between the frequency of eating fruit and vegetables and body mass index (BMI). People who are in the acceptable weight range ate fruits and vegetables more frequently than those who are obese (Pérez, 2002 March).

The B.C. Nutrition Survey (BCNS) found similar findings. In its survey of 1,823 B.C. adults in 1999, it not only found higher rates of obesity and inactivity than the CCHS 2000/01 (see box on page 64), but also that the majority of men and women in B.C. (as high as 84 per cent in some age groups) ate less than the recommended amount of fruits, vegetables and milk products. Taking into account the contribution of both food and supplements, it also found:

- Many British Columbian adults have inadequate intakes of folate, vitamins B6 and B12, vitamin C, magnesium and zinc.
- Intake of calcium and fibre was below recommended levels for all adults.
- 10 to 14 per cent of pre-menopausal women had inadequate iron intake.
- 25 per cent were consuming more than 35 per cent of their caloric intake from fat.
- Supplement use is widespread among B.C. adults and increases with age; 80 per cent of women 71 years and older reported taking nutritional supplements.

The BCNS has created the first provincial database of food consumption and nutrient intakes that will service as a baseline for future nutrition monitoring (Forster-Coull, personal communication, June 23, 2003).

It is hard to eat well if you are worried about having enough to eat. Not surprisingly, those who do eat well rarely felt insecure about food supplies. Fortunately, the majority of British Columbians do not experience hunger at the drastic levels of people living in poorer parts of the world. However some British Columbians feel anxious or insecure about food supplies. In the Canadian Community Health Survey 2000/01, 11.8 per cent of B.C. respondents (age 12 years and over) said they are worried about having sufficient food to eat and 8.3 per cent reported that they did not have enough to eat.

National data based on the earlier National Population Health Survey 1998/99 suggest that children aged 0 to 17 were the age group most likely to live in food-insecure households (Statistics Canada, *The Daily*, August 15, 2001). Feelings of food insecurity are associated with poorer health status. The same survey reported that twice as many respondents in food-insecure households rated their health as "fair" or "poor", and three times as many reported emotional distress, than those in food-secure households.

Food insecurity levels are slowly increasing. One indicator is the reliance on food banks. In Canada, the number of people who used a food bank was 747,665 in March of 2002. This is 12.5 per cent increase from 1997 (Canadian Association of Food Banks, 2002 October). For British Columbia, food bank use has increased since 1997. Over 100 food banks and associated agencies are currently operating in this province. The Greater Vancouver Food Bank alone feeds over 25,000 people each week. A 2001 report on *The Cost of Eating in B.C.*, authored by the Dietitians of Canada, showed a five per cent increase in the cost of healthy eating over the previous year. This translates into $30 more, or $626 a month, to feed a family of four. High housing cost is a major factor consuming large portions of the low-income earners' wages. This means they have to rely more heavily on food banks – an option never intended as a long-term solution to hunger.

Bicycle Helmet Use

In the 1999 Annual Report we reported findings from the 1996/97 National Population Health Survey (NPHS) that more than half (53 per cent) of British Columbians who ride bicycles said they always wear a helmet when cycling. This was a significant increase since 1994/95 when only 29 per cent reported always wearing a helmet. No new trend data from the NPHS or the CCHS is available.

However, a 1999 study by the Traffic Injury Research Foundation (Ontario) examined the impact of British Columbia's mandatory bicycle helmet law, the first such law in North America, which was passed in 1996. The study found that three years after the legislation was passed, bicycle helmet use for B.C. had increased further to over 70 per cent by 1999 (Beirness, 2000). The same study found variation in helmet use for rural and urban areas –

rural areas were estimated at 58 per cent and the Greater Vancouver and Victoria areas were estimated at 74 per cent. The study reported that this law has proven to be an excellent example of the effects of legislation on influencing behaviour and enabling both individuals and the community to benefit from it.

The increased acceptance of bicycle helmets and their high rate of use suggest that the individual is playing an active role in preventing head injuries and other injuries. Any further reductions in injuries from cycling are therefore more apt to come from improved engineering and city planning. An example would be creating designated bicycle routes that keep cyclists safe from motor vehicles and other city hazards.

High-Risk Sexual Practices

High-risk sexual practices include having multiple sexual partners, having sex without a condom (in a short-term relationship), and not using an effective method of contraception. There is no updated information on the sexual practices of the province's population based on these definitions. The last provincial data for high-risk sexual practices were from the National Population Health Survey 1996/97. In that year, one in four British Columbians age 15 to 69 years, who were in relationships of less than 12 months' duration, did not use a condom the last time they had sex.

In terms of the number of sexual partners, youth is the only group on whom more recent data are available. Of the youths that are sexually active, one out of four said they had four or more sexual partners (The McCreary Center Society, 1999).

High-risk sexual practices can lead to sexually transmitted diseases (STD) and unintended pregnancies. Although these outcomes are steadily decreasing, there were still 2,100 reports of STD in 2002 (B.C. Centre for Disease Control, unpublished tables, 2003 July) and another 4,676 reports of teen pregnancies in 2002 (B.C. Vital Statistics Agency, August 2003) for teenagers between 15 to 19 years. This translates as a teen pregnancy rate of 20.5 per 1,000 females for age group 15 to 17 years and 56.5 per 1,000 females for those 18 to 19 years. These rates, while still above the target, represent an improving trend in teen pregnancy rates.

The McCreary surveys showed some encouraging findings on sexual practices of B.C. teens in grades 7 to 12. More teens are delaying onset of sexual activity. The 1998 McCreary survey found that a higher proportion (77 per cent) have never had sexual intercourse, compared to 1992 survey (70 per cent).

EUROPE HAS BETTER TEEN SEXUALITY OUTCOMES THAN CANADA AND U.S.

Scandinavian countries, the Netherlands and Germany all have teen pregnancy rates, birth rates and abortion rates (per 1,000 women age 15 to 19 years) well below Canada and the United States. For example in the Netherlands, pregnancy rates are 8.7 per 1,000 and abortion rates are 4.2 per 1,000. In Canada, the pregnancy rate is 54.7 per 1,000 – two to four times higher than these European countries; and up to six times that of Holland.

Despite an openness towards sexuality in those countries, onset of sexual activity is the same in Europe and North America. However, European teens report fewer sexual partners and much lower rates of sexually transmitted diseases. Despite easier access to abortion, abortion rates are generally lower than in North America.

A U.S.-based organization, Advocates for Youth, which annually compares European/North American statistics, found the difference lies in the approach to sexuality in teenagers, particularly the belief that sexuality is a normal and healthy part of being human.

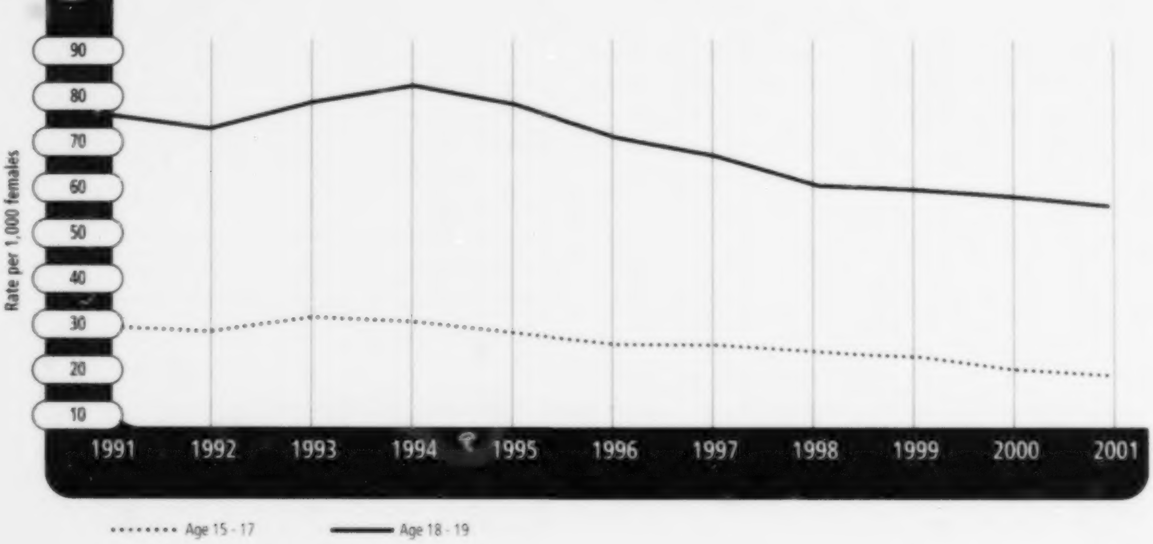
- **Programs are geared not to prevent sex, but to stop unwanted consequences.**
- **Access to contraception is unimpeded or even free.**
- **Prevention programs focus on safety, pleasure and responsibility.**
- **Political or religious groups have little influence on public health policy.**
- **As a consequence, most European teenagers believe "it is stupid and irresponsible" to have unprotected sex.**

(Feijoo, 2001).

Teen Pregnancy

It is assumed that most pregnancies among teenage women, particularly those under age 18, are unintended. An unintended pregnancy exposes the parents and the child to a number of risks - physical, psychological, economic and social. Early teenage

FIGURE 4.11 Teen pregnancy rate, B.C., 1991 to 2001



Source: B.C. Vital Statistics, B.C. Ministry of Health Planning.

childbearing is of particular concern because it can affect a young woman's development and life opportunities and create an unstable home life for the growing child.

The target for teen pregnancy was set at 20 per 1,000 teenage females in the 1999 Annual Report. In 2001, the rate for younger teen females, age 15 to 17, is closer to the target at 20.5 per 1,000 (see Figure 4.11). Although the rate for females age 18 to 19 years is declining, it is still too high at 56.5 pregnancies per 1,000 females (nearly three times the target teen pregnancy rate). Many teenagers choose to terminate their pregnancies, but about 2,150 new babies are born yearly to teenage mothers age 15 to 19 years, averaged over the period 1993 to 2001 (B.C. Vital Statistics Agency, 2003 August).

A decade ago, less than half of all teen pregnancies ended in abortions. In 2001, 62 per cent of teens 15 to 17 years of age and 56 per cent of older teens, 18 to 19 years, terminated their pregnancies.

The decline in teen pregnancy rates may be an indication that we are providing more effective education and increasing access to contraception. However, the increasing teen abortion rates show that too many young women are still experiencing the trauma of unwanted pregnancy and are not using reliable contraception despite

AN OUNCE OF PREVENTION

The data from a variety of British Columbian sources clearly indicate that adolescence is a time of special risk and adaptation as teenagers pass through puberty and attain adult status. On this journey adolescents typically engage in a range of experimentation behaviours.

However, knowledge, attitudes and behaviours that are established in childhood and youth set a pattern – whether good or ill – for behaviours and circumstances in later adult life. The impact is felt not just by the individual, but by communities and society at large.

British Columbia, like many other jurisdictions, has in the past failed to take advantage of the opportunities that a "captive" school age population presents. The Office of the Provincial Health Officer recently released a report that presented compelling data to encourage policy makers to use the school as a setting for health promotion. This report can be found on

http://www.healthplanning.gov.bc.ca/pho/

being sexually active. More should be done to promote healthy, responsible sexuality and alternative methods to abortion, such as the more widespread availability of emergency contraception.

In December 2000, B.C. pharmacists became certified to dispense emergency contraception (EC) without a doctor's prescription. Sometimes called the "morning after pill", emergency contraception can be taken up to 72 hours after unprotected intercourse and may prevent conception by stopping the ovaries from releasing an egg, stopping sperm from fertilizing the egg, or stopping implantation in the uterus of the embryo. Along with more than 100 pharmacies in B.C., emergency contraception can also be obtained from family doctors, walk-in clinics, Planned Parenthood, youth clinics, sexual assault centres, public health units and emergency departments.

Many young women and their partners are not aware of the widespread availability of emergency contraception and its existence needs consistent promotion. A recent study looking at the impact and awareness of emergency contraception surveyed women attending five B.C. abortion clinics over a six-month period and found that while the majority had heard of emergency contraception, most were unaware of their own personal risk of pregnancy and were unaware of how to obtain EC. Only 17 per cent knew they could obtain it from their pharmacist. The majority said that if they had been able to have EC on hand to take as needed they would have used it. In general, knowledge about EC was significantly less among Cantonese/Mandarin and Hindi/Punjabi women (Soon et al., 2003).

Where Do We Go From Here?

Changing behaviours can be a life-long process. Creating supportive conditions for change can also take a long time. Based on the information available, British Columbians are making better and healthier choices in some areas of their lives, particularly in smoking and bicycle helmet use, but more improvement is needed in responsible alcohol consumption, healthy eating and physical activity.

Smoking

In the 1999 Annual Report, a smoking rate of 15 per cent was set as the target for British Columbia. In B.C., rates have dropped by 5.3 per cent in six years to 20.5 per cent – that is about a one per cent reduction per year. We should aim to continue this trend of a percentage a year, reaching 12 per cent or lower by 2009. The B.C. Ministry of Health Planning is currently finalizing the Tobacco Control Strategy. One of its goals is to identify and eliminate disparities related to tobacco use and its effects among different population groups (age, ethnicity, socio-economic and geography). We are hopeful that this strategy will help us to reach the smoking rate of 12 per cent by the end of the decade or sooner.

Drinking

The number of heavy drinkers in B.C. is increasing and the liberalization of the B.C. liquor laws will make alcohol even more available. While moderate alcohol consumption is not harmful and may even be helpful to some, excess alcohol consumption or irresponsible drinking can harm the health and well-being of individuals, families, children and even innocent bystanders. Alcohol consumption during pregnancy can create lasting harm for the unborn child. New policies should be monitored and evaluated to ensure they are not contributing to the societal harm caused by alcohol and leading to a greater prevalence of addiction, disease and injury. More resources should be put toward alcohol prevention, treatment and rehabilitation.

Physical Activity

Fifty per cent of British Columbians are still physically inactive. There is no indication that the trend is reversing. It is unfortunate that we have not met the target of reducing inactivity by 10 per cent per year. As the recent B.C.

Where Do We Go From Here? (Continued)

Nutrition Survey noted, part of the problem may be that 80 per cent of individuals surveyed were inactive, but felt they were physically active enough. Motivation was lacking and the majority said they did not have enough time for exercise. More research is needed about ways to motivate individuals to take up a more active lifestyle. The lead up to the 2010 Olympics in Vancouver/Whistler is an opportunity to promote physical activity among all British Columbians, not just among elite athletes.

Healthy Eating

In general, most British Columbians should be eating more fruits and vegetables and consuming less fat, refined carbohydrates and sugar. The B.C. Nutrition Survey provides important baseline data to help us measure our progress in the years ahead, but more research is needed into effective programs that help people adopt and maintain a healthy diet. As well, we need to raise awareness among British Columbians about the issue of food insecurity and hunger. In a survey of Canadians, almost one in three British Columbians opted for a "don't know" response when asked if they could name the principal users of food banks. Respondents from other provinces have better knowledge of food bank users; many citing homeless people, single mothers with children and seniors as principal users (Simpson, 2002 August).

Helmet Use

Like seatbelt use, bicycle helmet use is now becoming widely accepted in regions where usage is high. Further reductions in injury are now more likely to come from engineering and urban planning, such as wider provision of safe bicycle routes in our cities and towns.

Healthy Sexuality

While high-risk sexual activity and unwanted pregnancy are not confined to teenagers, those entering adulthood often have the greatest difficulty negotiating safe sex or taking responsibility for their emerging sexual identities. We can learn from the European approach (see box on page 66) by adopting a more open and accepting attitude to the inevitability that our teenagers will become sexually mature adults. We can do so by providing programs and policies that ensure the transition is safe and marked by awareness, respect and responsibility. It is through this approach that our rates for teen pregnancies, sexually transmitted diseases and abortions can be reduced.

A positive development is the introduction of a renewed Career and Personal Planning (CAPP) education program offered to all students from Grades 8 to 10. It covers a wide range of topics including education on sex and family life and on prevention of child abuse, substance abuse and injuries. Programs like CAPP allow teenagers to make informed decisions and hopefully assist them through their teenage years. However, evidence from Europe suggests that these programs can be even more effective if they are begun in early elementary school and continued through to Grade 12. In addition, CAPP guidelines can be interpreted very broadly and some teachers may only emphasize abstinence. Consistent and comprehensive curriculum guidelines are needed for sexual and reproductive health. (See box on page 67.)

The target for teen pregnancy has been set at 20 per 1,000 teenage females in the 1999 Annual Report. The rate for younger teen females (15 to 17 years) is closer to the target. But rate for females 18 to 19 years are still almost three times higher than the target.

What Actions Can We Take?

As in the 1999 Annual Report, many of the recommendations still apply.

Individuals:

- Maintain a smoke-free home.
- Build physical activity into your everyday life.
- Follow Canada's Food Guide to Healthy Eating and eat together as a family.
- Be aware of food insecurity and hunger issues.
- Prevent injuries by wearing the necessary safety gear.
- Practice safe sex.
- Seek help for addictions.

Employers:

- Provide smoking cessation information.
- Support employees' efforts to incorporate physical activity by providing fitness facilities and time for workouts.
- Ensure cafeterias serve nutritious meals.
- Designate bicycle and car-pool parking spaces.
- Provide information on mental health and addiction resources.

Schools:

- Involve youths in planning and implementing alcohol, drug and tobacco education programs.
- Require quality and daily physical education for every grade and emphasize life-long physical activity as part of healthy living.
- Ensure that foods available at school contribute to good nutrition and lifelong healthy eating habits.
- Develop effective health education programs for all grades.

Governments:

- Ensure smoking cessation services are offered to smokers by working together with the medical profession and health care providers and legislating all public premises to be smoke-free.
- Provide comprehensive plans for dealing with addictions and reducing harms caused by alcohol and other drugs; monitor and evaluate the impact of liberalized liquor laws.
- Support schools, community and voluntary organizations in their program and efforts to increase physical activity and healthy eating habits among individuals of all ages.
- Make sure that British Columbians have access to up-to-date knowledge about reproductive health services, emergency contraception and prevention of sexually transmitted diseases.
- Develop legislation requiring restaurants to disclose basic nutritional facts on menus.
- Address underlying social and economic factors that affect teen pregnancy, poverty, emotional deprivation, hunger, school failure and lack of hope for the future.

Independent Living

Personal freedom and personal control over one's life are cherished hallmarks of a democratic society. Those who are healthy often take this freedom and independence for granted; those with physical or mental challenges have lobbied for decades to make our cities and living environments more accessible and supportive so that they, too, can express their independence and freedom in our communities.

Seniors consistently identify independence and the ability to live in their own homes as important issues for them. A way to measure this achievement is to know the proportion who are capable of participating, planning and managing their personal daily living in the community with minimal support.

About half a million people (age 15 years and over) in this province live with some form of disability. Disabled British Columbians also want to live as independently as possible but less is known about their living arrangements or amount of daily assistance they require. So far, only survey results of the prevalence, type and severity of disability by age and gender have been released through the report called *A Profile of Disability in Canada* (Statistics Canada, 2002 December). Also recently released are details related to employment, education, and income of adults with disabilities.

What Does The Indicator Show?

- B.C. seniors are increasingly independent and able to continue living longer at home, with 94.5 per cent of people 65 years and older still in the community and only 5.5 per cent in long-term care homes or care facilities. While this number is being decreased further through new policies that promote assisted living in the community and a reduction in reliance on long-term care, it is not clear what the ideal level of institutionalization should be.
- While no reliable indicators are available, the province's five regional health authorities have set targets to improve options for independent and supportive living for the mentally ill and disabled.

Living Arrangements, Age 65 And Older

In British Columbia, approximately 551,800 persons are age 65 years or over. Of this group, 94.5 per cent are reported to be living in the community alone or with their families. The assumption is that these living arrangements allow them to be connected to the community and that they require minimal assistance in their daily chores. In other words, these seniors are independent, healthy and economically able to live in the community.

EARLY STUDIES GIVE IMPETUS TO GREATER INDEPENDENCE FOR SENIORS

More than 25 years of research increasingly shows that seniors who retain as much personal control and independence as possible have longer, healthier lives.

In two landmark studies in 1976 and 1977, Harvard and Yale researchers gave similar residents of two floors of a nursing home two very different messages. One floor was told everything would be done for them – they could have a plant, but staff would water and care for the plant; they could see a movie, but staff would choose the movie; menus would be decided for them etc. The second floor was given a message stressing their personal control – they could choose a plant and must take care of it, they could decide if and when they wanted to watch a movie and choose the show etc.

Three weeks later, those given the message of greater autonomy were significantly happier, more sociable and more active than those given the message they were cared for. And 18 months later the independent group not only reported feeling happier and more active, doctors rated them in better mental and physical health and 30 per cent more of them were alive than on the "cared-for floor" (Langer & Rodin, 1976, 1977).

Since that time, an increasing number of studies and surveys of seniors have shown that greater independence and control translates to healthier, happier, longer lives.

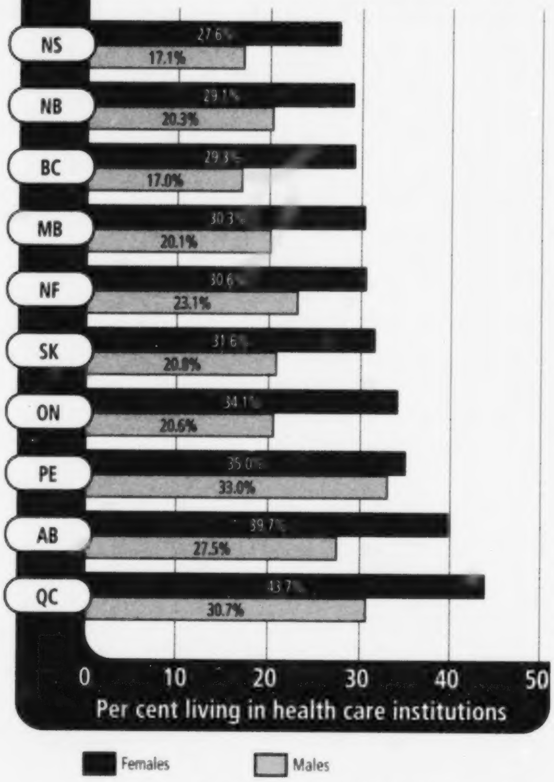
The remaining 5.5 per cent live in collective dwellings including health care institutions. This is not much change from the 1996 Census findings.

But an encouraging sign is that a higher proportion of seniors in B.C., especially those 85 years or older, are living independently compared to the rest of the country. Although B.C.'s proportion of older seniors is slightly higher than the rest of the country, it has one of the lowest proportions of older seniors living in health care institutions (see Figure 4.12). Only 29 per cent of older female seniors and 17 per cent of older male seniors, compared to 35 per cent and 23 per cent respectively in Canada, are living in health care institutions (Statistics Canada, 2002 October).

New B.C. government policy is also shifting focus away from a medical model of care for seniors towards a social housing and support model of care, which aims to keep the elderly independent

FIGURE 4.12

Proportion living in health care institutions by province, Age 85 years and over, 2001



Source: Statistics Canada. (2002, October 22). *Profile of Canadian families and households: Diversification continues.* http://www12.statcan.ca/english/census01/products/analytic/companion/fam/pdf/96F0030XIE2001003.pdf

in the community with the appropriate level of support. This shift will be supported by the new *Community Care and Assisted Living Act* (Bill 73), which will be enacted in 2003/04.

A new "needs-based" policy was introduced in 2002 and provides placement in care facilities based on a standard assessment of urgency, not on the length of time someone has been on the list. This should help ensure that those with the highest need for institutional care have access to new vacancies. However, we must ensure that sufficient capacity is available to meet urgent needs.

While independence is an important goal and usually equates to a higher quality of life, some level of institutionalization will be required for individuals who are unable to live safely or comfortably in the community. As we stated in 1999, we do not know what the ideal rate of institutionalization would be. We must ensure, however, that we are not reducing institutionalization levels below what is needed for optimum care. Since women are the majority of caregivers, we must also ensure we are not simply shifting the burden of care on their shoulders.

Simple supports may be all that are required to keep many of the elderly independent. A B.C.-based research study in 2001 found services like housecleaning appear to help maintain the elderly's functioning and prevent deterioration. It is also a less-costly option in the long run (Hollander, 2001). Comparing similar populations that had the housecleaning services to others that lost the services through cost-saving policies of the mid-1990s, investigators found that in the second and third year after the cuts both health care costs and institutionalization rates increased for those whose services were cut. By the third year, annual health costs for those without housecleaning services were $4,000 higher than those with housecleaning services, and 17 per cent had been institutionalized compared to only 7 per cent of the seniors with housecleaning services. The government and regional health authorities should be wary about policy changes that appear on the surface to be cost-effective, but in the long run translate to higher costs and less independence.

Fostering Independence Among People With Disabilities And Mental Illness

Like the elderly, other members of society, particularly the mentally ill and disabled, benefit from being able to live as independently as possible either in supportive living arrangements or with home support. Reliable data for these populations, however, are not available. All five regional health authorities in B.C., as well as the Ministry of Health Services, have set performance targets from 2003 to 2005. These targets include less institutionalization and more independent living options for these often high-needs clients. They also include providing supportive care and rehabilitation for the mentally ill closer to their home communities, rather than institutionalizing them in the Lower Mainland[d]. These programs and targets should be monitored and evaluated to ensure they are providing appropriate care and independence for these populations and not simply cutting needed services.

Where Do We Go From Here?

The greater focus on supporting independence for seniors, the disabled and mentally ill is a positive trend. In theory and in practice, a higher quality of life is achieved by living independently than in an institution. However, we must be careful that in our focus on promoting independence we do not prevent access to care-facility beds for people who need them and cannot live safely in the community. Policy changes should be monitored and evaluated to better assess their impact on all sectors of society, including various ethnic groups, families and caregivers. We do not yet know the ideal rate of institutionalization, therefore, a target rate is not proposed.

What Actions Can We Take?

Governments:

- Maximize opportunities for people to reach the highest levels of independence they comfortably can in all aspects of life – home, work and community.
- Provide adequate community supports to enable independent living for vulnerable groups.
- Monitor and evaluate the impact of policies that support or affect the level of independence for our most vulnerable citizens.

FOCUS ON SENIORS' SKILLS, CAPACITIES AND CHOICES

The choices, skills and capacities of B.C. seniors translate to better health for them, too. Here's how they fare under Health Goal 2's indicators:

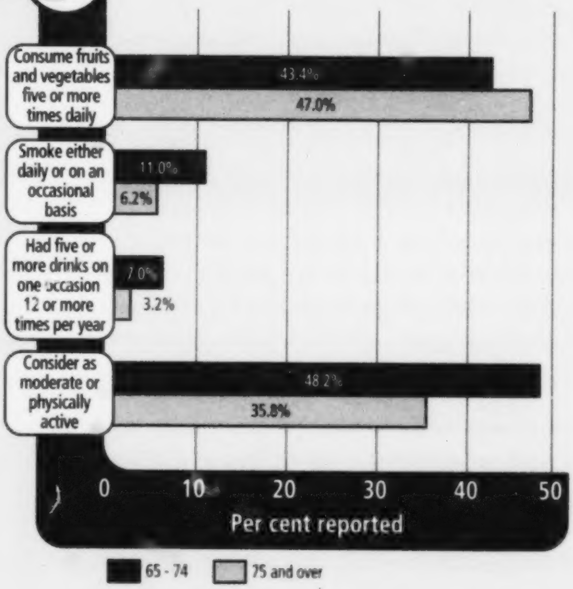
Education

- Seniors in B.C. have lower levels of formal education than non-seniors, probably due to fewer opportunities and facilities for schooling in their youth. Just 50.6 per cent of B.C. seniors have at least high school qualifications and only 33 per cent have post-secondary qualifications, such as a college diploma, university degree or trade certificate.

Smoking

- Seniors have the lowest rate of smoking among B.C. adults, with daily or occasional smokers representing only 11 per cent of those age 65 to 74 and only 6.2 per cent for those age 75 and older (Canadian Community Health Survey 2000/01) (See Figure 4.13) It is possible that heavy smokers do not live long into their senior years.

FIGURE 4.13 Health behaviours, Seniors, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 October), http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm.

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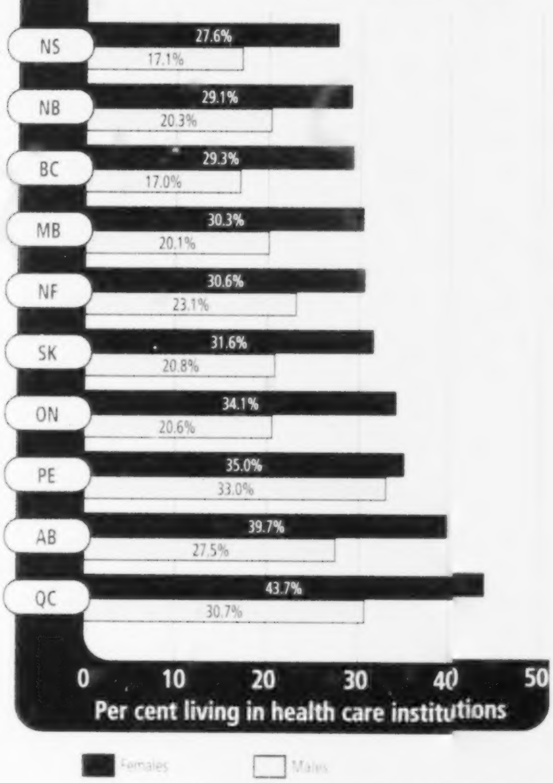

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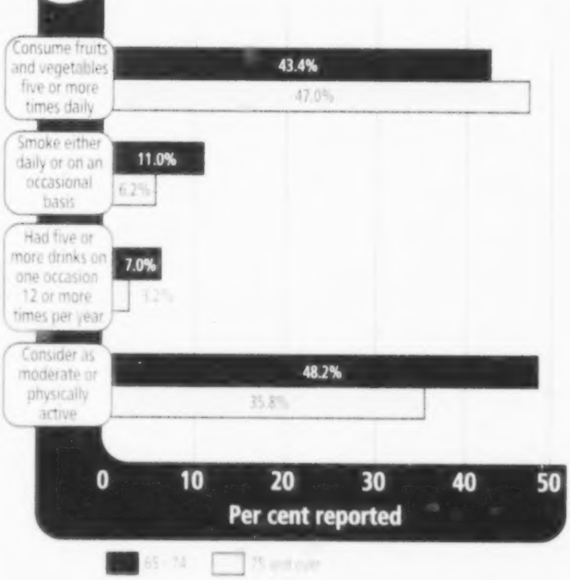


Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 October). http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

FOCUS ON SENIORS' SKILLS, CAPACITIES AND CHOICES (CONTINUED)

Drinking

- B.C. seniors are also not frequent drinkers. Only seven per cent of younger seniors are considered heavy drinkers – drinking five or more drinks on one occasion, 12 or more times a year. For older seniors, the proportion of heavy drinkers is even lower. Again, the propensity for heavy drinking may preclude a long life.

Activity

- The elderly in the country generally have more leisure time than younger people. Television viewing accounted for the largest share of the free time of older persons (*A Portrait of Seniors in Canada*, Statistics Canada, 1999). Among B.C. seniors, 48.2 per cent of younger seniors are moderately or physically active. Among older seniors, 35.8 per cent are moderately or physically active.

Healthy Eating

- B.C. seniors eat a healthier diet than others, with 43.4 per cent of younger seniors and 47 per cent of older seniors consuming fruits and vegetables five or more times per day.

Independent Living

- In the 2001 Census, 94.5 per cent of seniors are living in the community alone or with their families. Among young seniors, only 1.3 per cent live in care facilities.

- More seniors are living with children and grandchildren in the same house. In 1986, only 150,000 households in Canada had three generations together but this had increased 49 per cent to 208,000 households by 1996 (Che-Alford & Hamm, 1999). The rise may be due, in part, to the increase in Asian and South Asian immigrants in Canada who tend to live in large extended families. In 54 per cent of the households, seniors contributed to finances. This finding may have implications for women who may be caregiving for two generations. While 40 per cent of the households had someone with an activity limitation, this family member was not always from the oldest generation in majority of the households. Sixty-three per cent were in the middle or youngest generation.

Seniors in B.C. are aging well, making healthy choices and keeping their independence in greater numbers than in the past.

HEALTH GOAL 3

CHAPTER 5

Physical Environment

GOAL 3: PHYSICAL ENVIRONMENT

Air

PM_{10} air pollution – *Improving*
Exposure to second-hand smoke – *Not much change*

Water

Water quality index – *Improving*
Boil-water advisories – *Worsening*

Food

Critical hazards in food premises – *Worsening*
Food quality samples meeting guidelines – *Not much change*

Land and Soil

Blood lead levels in children – *Improving*

Sustainability

Greenhouse gas emissions – *Worsening*
Energy consumption – *Not much change*
Land in protected areas – *Improving*

A diverse and sustainable physical environment with clean, healthy and safe air, water and land.

The physical environment in which we live can have a direct bearing on our health, contributing to outbreaks of disease, acute and chronic illness and undermining quality of life and general well-being. The aim of Goal 3 is to protect human health and safety by ensuring clean and safe water, land and air. Maintaining a healthy environment and a sustainable resource base is a challenge for the 21st century. Globally, there are signs that our soils and waters may be compromised, our food chains disrupted and our climate warming – all changes that can threaten our long-term health and even physical survival. Contamination and hazardous conditions can cause illness, disease outbreaks and other threats to human health.

Compared with more heavily populated and industrialized parts of the country and the world, British Columbians are very fortunate. In general we are exposed to lower concentrations of environmental pollutants such as dissolved chemicals, heavy metals and air contaminants than in other parts of the world. Many of the risks associated with chronic low-level exposure to pollutants or pollutant mixtures remain to be elucidated. However, observable health effects have been documented for pollutants at the low levels seen in British Columbia (for example, for the air pollutants PM_{10} and ozone).

The physical environment – the ecosystem we live in – is complex, making it impossible for any one indicator to definitively capture changes. B.C. is working to develop targets, standards and goals to guide environmental management of industry, transportation, energy and other sectors. It is also working to coordinate with federal initiatives to meet global commitments.

Health Goal 3 uses ten indicators in four categories to measure the health of our physical environment and its sustainability, each of which is discussed in this report.

- **Air** – exposure to particulates; exposure to second-hand smoke
- **Water** – water quality index, boil-water advisories
- **Food** – critical hazards in food premises, food quality samples meeting standards
- **Land and Soil** – blood lead levels
- **Sustainability** – greenhouse gas emissions, energy consumption, land in protected areas

Additional indicators and more detailed statistics are available from the B.C. Ministry of Water, Land, and Air Protection (MWLAP), State of Environment Reporting Office, particularly the report *Environmental Trends in British Columbia 2002* (http://wlapwww.gov.bc.ca/soerpt/index.html).

NOW TWO MINISTRIES FOR B.C.'S ENVIRONMENT

In June 2001, the former B.C. Ministry of Environment, Lands and Parks was split into two. Now the B.C. Ministry of Water, Land and Air Protection has the mandate to protect and enhance the quality of British Columbia's environment.

The B.C. Ministry of Sustainable Resource Management is responsible for strategic planning, policies and resource information in support of the sustainable economic development of Crown land, water and resources while maintaining environmental integrity.

Both ministries have established their own environmental goals and indicators and are monitoring those to evaluate performance.

Air

Air pollution can pose a serious threat to public health. It can impair breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems and damage lung tissue, contributing to cancer and premature death. Children, the elderly, and individuals with heart or lung disease are most at risk from air pollution. Research has shown that the risk of premature mortality and hospitalizations from cardiovascular and respiratory diseases increases with daily exposure to fine particulates. These effects occur at concentrations frequently found in a number of B.C. communities.

Particulate matter (PM) is a major component of smog and includes naturally occurring dust as well as soot, smoke, liquid droplets and other particles emitted by vehicles, factories, power plants, construction and other human activities. This section presents information about two key airborne risks facing British Columbians: small airborne particulates called PM_{10} and $PM_{2.5}$; and exposure to second-hand smoke.

What Do The Indicators Show?

- There is a slight improvement in the particulate matter air quality indicators since 1999. In 2000, 25 out of 40 communities (62.5 per cent) monitored for PM_{10} air pollution showed levels at which health risks are known to occur, more than 5 per cent of the time. Twenty-one of these communities exceeded this level more than 10 per cent of the time. This is an improvement from previous years.
- Air quality appears to be improving in several communities. Twelve communities have shown consistent improvements in the concentrations of PM_{10} over a three-year period.
- On average, PM_{10} concentrations in 2000 were greater in communities in the interior than within the Lower Fraser Valley and Greater Vancouver Regional District – a finding that remains unchanged since the 1999 Annual Report (MWLAP, 2002).
- Health issues arising from second-hand smoke persist for children and for some workers, despite B.C. having the lowest smoking rates in Canada.

AIR POLLUTION AND HEALTH

- **Health Canada has determined from Canadian respiratory hospitalization data that every 100 parts per billion increase in the one-hour maximum ozone level is associated with a one per cent increase in respiratory hospital admissions and a 0.6 per cent increase in mortality.**
- **The health costs of particulates in smog are forecast to reach $1.5 billion by 2005 (Environment Canada).**
- **Based on a recent study of the air quality of the Lower Mainland (Brauer, et al., 2000), an estimated 15 to 150 deaths per year in the Fraser Valley may be attributable to air pollution.**
- **In 1995, a UBC Department of Medicine researcher estimated that increases in particulate pollution may be responsible for 82 premature deaths in B.C. every year; 146 hospitalizations due to asthma, lung and heart disorders; and 354 extra emergency room visits for asthma, chronic bronchitis or emphysema (Vedal, 1995).**

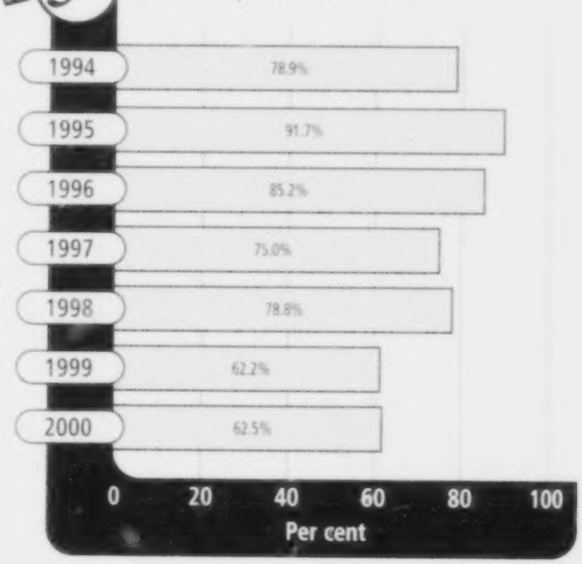
Airborne Particulates

A steadily improving trend in air pollution reduction was noted in the 1999 Annual Report, with evidence that some communities with high levels have been able to reduce their daily concentrations of PM_{10}. This trend is continuing.

PM is divided into classes according to particle size. PM_{10} refers to particles 10 micrometres or less (about 1/8th the width of a hair), which are considered inhalable. The Air Resources Branch of MWLAP uses a threshold value of 25 micrograms of PM_{10} per cubic meter of air because this is the concentration above which health risks are known to occur. In 2000, 25 out of the 40 monitored communities monitored by MWLAP for PM_{10} air pollution showed levels at which health risks are known to occur, more than 5 per cent of the time (see Figure 5.1). But, this is still an improvement from previous years.

FIGURE 5.1

Percentage of monitored communities exposed to health risks from PM_{10}, for more than 18 days, B.C., 1994 to 2000



Source: B.C. Ministry of Water, Land and Air Protection

Different communities are exposed to different forms of air pollution. In urban centers, gasoline and diesel powered cars, trucks, motorcycles, buses, aircraft and marine vessels, are the single largest contributors to air pollution emissions (Bates, 2002). In rural communities, the most common pollution sources are wood smoke, agricultural burning, mining, quarrying and other sources including manufacturing and power generation.

Based on the MWLAP PM_{10} definition, the less-rural communities in the southwest of B.C., including Vancouver Island, have the best air quality. Residents there were exposed to health risks from particulates from less than 1 per cent to 11 per cent of the time in 2000. Communities in the rest of the province in general were exposed to health risks from particulates more often, from less than 1 per cent to 40 per cent of the time (MWLAP, 2002). As a result, a phase-out of beehive burners is continuing, while smoke control regulations, particularly governing large-scale open burning, along with higher standards for wood stoves, are helping target the main sources of rural pollution.

TABLE 5.1 **DEFINITE AND PROBABLE EFFECTS OF FINE PARTICLES (PM_{10} AND $PM_{2.5}$)**

Pollutant	Definite Effects	Probable Effects
Fine particles (PM_{10}, $PM_{2.5}$)	Increased mortality due to respiratory and cardiac conditions Aggravation of asthma Increased hospital admissions for respiratory and cardiac conditions Depressed lung function in schoolchildren (acute and chronic) Increased prevalence of bronchitis Increased risk of lung cancer School absences increased Increased blood clotting; increase in white blood cells; increased heart rate in the elderly; reduced heart rate variability	Aggravation of acute respiratory infections Increased risk of wheezy bronchitis in infants 4-12 months Decreased rate of lung growth in children

Source: Adapted from Bates, D.V. & Vedal, S. (2002). Chapter 4: Adverse health effects. In D.V. Bates & R. B. Caton (Eds.). *A citizen's guide to air pollution* (2nd ed.). Vancouver, BC: David Suzuki Foundation.

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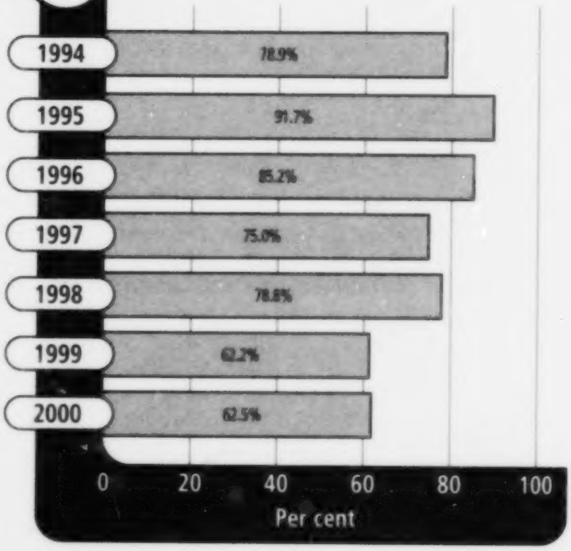

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Whether or not a person's health is undermined by exposure to airborne particulates depends on the combination of concentration and length of time exposed as well as the health and age of the individual and sometimes the source of the particulate matter. Table 5.1 lists the definite and probable effects of poor air quality.

Monitoring Smaller Particles

There have been scientific refinements in the use of the PM indicator. Studies suggest that smaller particles ($PM_{2.5}$ or less) are the size that poses the greatest risk to health because they can be inhaled more deeply into the lungs. In addition, it is known that fossil fuel combustion in mobile sources, such as cars and trucks, contributes to the finer particulate size. While we did not follow the indicators for $PM_{2.5}$ in the 1999 Annual Report, this is now an emerging indicator that appears to be a more relevant method to measure the true impact of air pollution on public health. This realization is reflected in the recent creation of a Canada-Wide Standard for $PM_{2.5}$, which is $30\ \mu g/m^3$ averaged over 24 hours, to be achieved by the year 2010 (Canadian Council of Ministers of the Environment, 2000 June).

In 2000, an estimated 45 per cent of the Fraser Valley $PM_{2.5}$ emissions came from mobile sources (Greater Vancouver Regional District and Fraser Valley Regional District, 2002). There are significant initiatives in the Lower Fraser Valley to address major and pressing causes of pollution such as transportation, industrial activity and energy dependencies. However, increasing population pressure presents an on-going challenge. As well, there were 1.2 million registered motor vehicles on Greater Vancouver roads as of 2001 – a number expected to increase by 60 per cent in the next 20 years. As fine particles in motor vehicle emissions have been implicated in adverse health effects, monitoring for $PM_{2.5}$ has been recently initiated at a number of Fraser Valley sites. We recommend that $PM_{2.5}$ monitoring be more widely adopted.

Ground-Level Ozone

Although not an official Health Goal indicator, ground-level ozone exposure can also impair breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems and damage lung tissue, contributing to cancer and premature death. Ground-level ozone is a secondary pollutant that forms when nitrogen oxides and volatile organic compounds react in the presence of sunlight. Scientists are uncertain why there are high levels of ozone in less populated areas, but it may be due to natural processes. In the Lower Fraser Valley, fuel combustion, natural sources and solvent evaporation contribute to ground-level ozone production on sunny days.

Measured ground-level ozone levels in B.C. did not exceed the Canadian standard for air quality (65 parts per billion) in 1998-2000. However, health effects can begin to occur at levels lower than the national standard, and can be compounded by the presence of other pollutants. This measurement is one that should be followed in future.

FEDERAL GOVERNMENT ACTION PLAN

In 2001, the federal government introduced an action plan on reducing emissions of particulate matter and the formation of ground level ozone. This includes updating vehicle standards for emissions for passenger cars, light-duty trucks and SUVs. New regulations will be imposed to reduce sulphur in on-road diesel fuel from 320 to 15 parts per million by 2006.

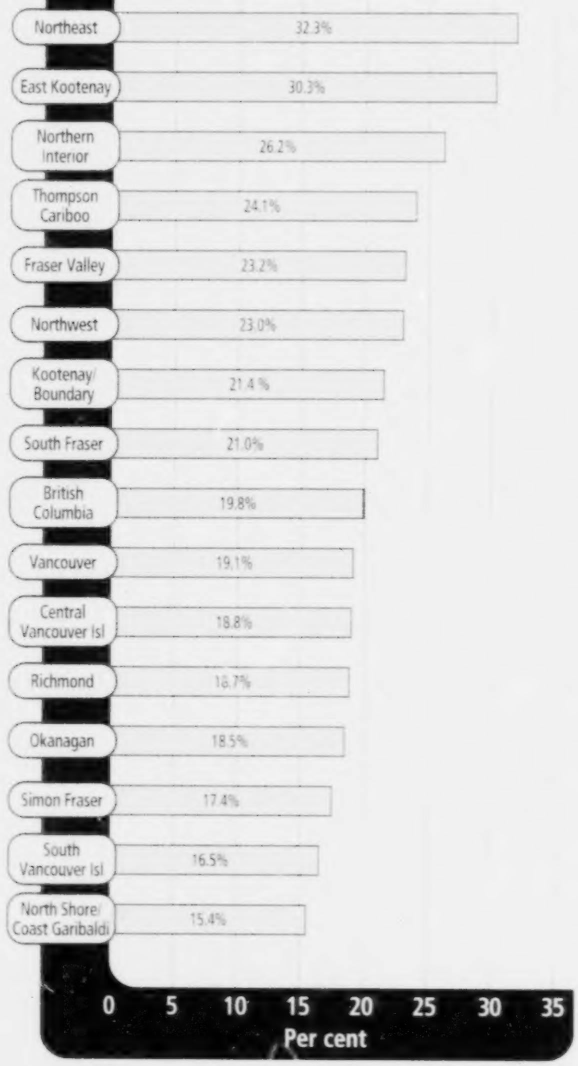
Exposure To Second-Hand Smoke

As we noted in Goal 2, B.C. now has the lowest overall smoking rate in the country and is on a downward trend, dropping from 25.8 per cent in 1994/95 to 20.5 per cent in 2000/01. Nevertheless, close to 6,000 British Columbians continue to die every year from smoking-related illness. As well, second-hand smoke is a major cause of preventable illness and death in B.C. "Environmental tobacco smoke", as it is called, contains almost 4,000 different chemicals, 42 of which have been identified by Health Canada as toxic. Each year in Canada, second-hand smoke kills at least 500 non-smokers and keeps thousands more from leading normal healthy lives.

Children are exposed to second-hand smoke in one out of five B.C. homes every day (Health Files, 2000). Children are particularly vulnerable to respiratory infections, such as bronchitis, pneumonia and ear infections, as a result of such exposure. Second-hand smoke can also increase the frequency and severity of asthma.

One in five British Columbians who do not smoke have reported in the Canadian Community Health Survey 2000/01 (CCHS) that they are exposed to second-hand smoke daily. There is not much

FIGURE 5.2 Per cent of non-smoking population exposed to second-hand smoke, Age 12 years and over, B.C. Health Service Delivery Areas, 2000/01



Notes: Sample size for North Vancouver Island HSDA is too small for reliable reporting.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 October) http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

change (reported 18 per cent) from a 1997 survey that we used for the 1999 Annual Report as the source for this indicator.

There are still significant regional differences in exposure to second hand-smoke among non-smokers (see Figure 5.2). Exposure ranges from a high of 32.3 per cent in the Northeast Health Service Delivery Area (HSDA) to a low of 15.4 per cent in the North Coast/Coast Garibaldi HSDA. Differences are explained by factors such as higher rates of smoking, greater exposure in the home and weaker regulatory by-laws, such as allowances for smoking rooms in bars and restaurants.

The Workers' Compensation Board established regulations in 1998 that prohibits workplace exposure to second-hand smoke, which effectively protects about 85 per cent of workers in B.C. In 2002, following the B.C. government's decision to modify a total workplace ban on smoking, the Workers' Compensation Board reintroduced second-hand smoke regulations for the hospitality industry, with provisions for designated smoking rooms. This move was designed to respond to the concerns of businesses, in smaller and outlying communities, that were anxious about loss of patrons. However, this means that the serving staff can still be exposed to the smoke of others. As there is no safe level of exposure to second-hand smoke and as studies continue to demonstrate no adverse economic impact from smoking bans, workplace bans should be reinstated.

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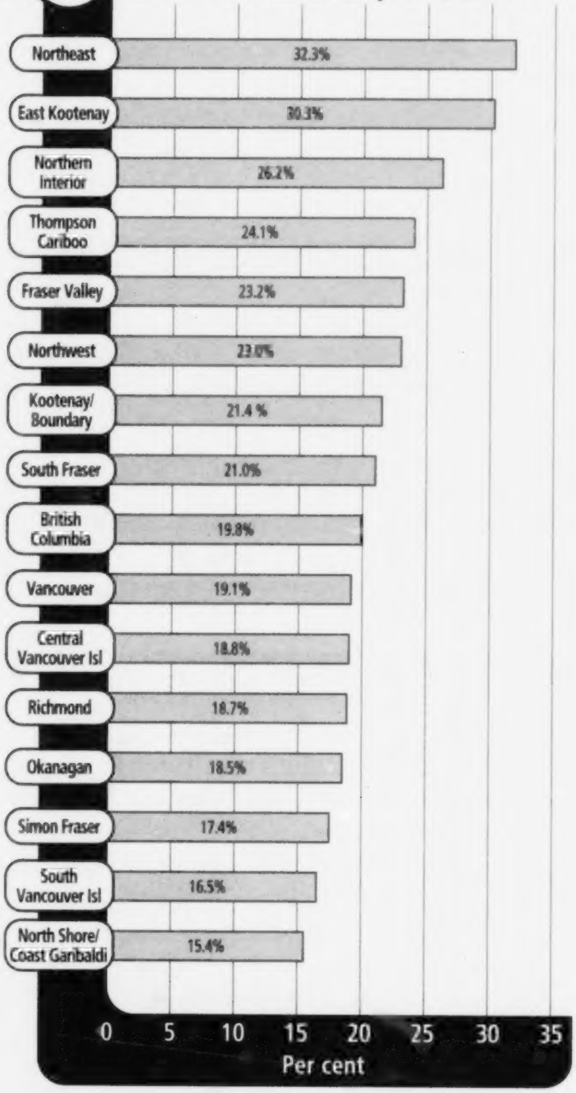

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Where Do We Go From Here?

According to the B.C. Ministry of Water, Land and Air Protection (WLAP), *Environmental Trends 2002* report, a number of initiatives designed to protect good air quality, and improve on poor air quality, have been taken in B.C. These include:

- development of a framework for airshed planning that can be applied to threatened airsheds;
- development of individual airshed management plans in Prince George, the Bulkley Valley, Greater Vancouver, Quesnel/ Williams Lake, Golden and the Fraser Valley;
- continuation of Air Care, an ongoing inspection program to reduce motor vehicle emissions in the Lower Fraser Valley, including a heavy vehicle testing program in the same region;
- modernization of air monitoring programs;
- continued phase-out of beehive burners
- Smoke Control Regulations governing large-scale open burning and wood stoves;
- Canada-wide standards for both fine particulate matter $PM_{2.5}$ and ground-level ozone have been set with targets to be achieved by 2010.

AIR QUALITY ACTION PLAN

The Fraser Basin is home to 2.6 million people, covers one quarter of B.C. and accounts for 80 per cent of the province's economy.

The Georgia Basin Ecosystem Initiative (GBEI) is a partnership with all orders of government, community, public and private participants to combat air pollution. The overall goal of its Clean Air Action Plan is to provide a level of air quality that supports healthy and vibrant communities and ecosystems. It has determined the air within the Canadian portion of the Georgia Basin must meet Canada Wide Standards and B.C. air quality objectives. Initiatives designed to meet those goals include the introduction of a Smog Indicator, a transportation plan, and emission regulations for industrial, commercial and institutional gas-fired boilers and heaters. The Smog Indicator has been available since 2000 on Environment Canada's ecosystem information Web site at www.ecoinfo.org

The GBEI ensures dialogue on cooperative air quality management in the transboundary airshed shared with Washington State's Puget Sound population. Sumas II, a proposed 66-megawatt gas-fired power plant in Sumas Washington, could further worsen air quality in the Fraser Valley.

The B.C. government has not supported the plant, and the Canadian National Energy Board has ruled that environmental assessments will be required before power lines can be built to the plant through Canada.

In 2000, 25 out of 40 communities monitored exceeded the fine particulate (or PM_{10}) levels at which health risks are known to occur, on more than 18 days (or 5 per cent of the time). Therefore, only 15 out of 40 communities are considered to have acceptable air quality. More needs to be done by government, communities and individuals to improve air quality according to this standard.

However, this standard is a measure of the frequency of exceeding a defined health threshold, and does not reflect the magnitude of the problem (for example, the maximum levels of PM_{10}). Given this limitation, and the current emphasis on $PM_{2.5}$ as the more active component of particulate matter, it would be worthwhile to develop a more meaningful health indicator based on $PM_{2.5}$ for monitoring air quality in the province.

With regard to second-hand smoke, the Provincial Health Officer recommended zero tolerance as a long-term target in the 1999 Annual Report. Clearly, this is a target yet to be met. However, tobacco reduction programs targeted at specific groups such as youth and Aboriginal communities appear to be effective. The outcomes of such strategies should be monitored on an ongoing basis.

What Actions Can We Take?

Individuals:

- Maintain a smoke-free home and encourage others to do likewise.
- Reduce the use of single-occupancy vehicles, by walking, carpooling, bicycling or using public transportation.
- Choose environmentally friendly methods of transportation.

Governments:

- Continue to develop local plans for managing and improving air quality.
- Focus on areas where pollution levels are highest and reduce these through targeting the primary sources.
- Encourage environmentally friendly forms of transportation in municipal planning.
- Design communities to reduce dependence on personal vehicle use.
- Improve reporting and monitoring of $PM_{2.5}$, the particles that are the greatest public health concern.
- Develop a health indicator for air quality that is based on $PM_{2.5}$.
- Reinstate the province-wide workplace ban for exposure to second-hand smoke.
- Continue efforts to make public places and workplaces smoke-free.

Water

Water is essential to life, yet it is also highly susceptible to being contaminated by the activities of humans, animals or nature. In 2000, the death of seven people and serious illness of dozens of others in Walkerton, Ontario was tragic proof that ignoring water quality issues can have dire consequences for the health of the population.

As we noted in the 1999 Annual Report, British Columbians often mistakenly believe that our abundance of mountain streams and high altitude lakes means our water is therefore pristine and pure. However, even "untouched" or protected watersheds in which no human has access can still carry disease-causing organisms introduced by wild animals. At least 75 per cent of British Columbians depend on surface water (such as watersheds, lakes, rivers) making ongoing monitoring, protection and careful management crucial. One-quarter of the population, or 750,000 people, depend on groundwater sources pumped by wells or from springs, which have other quality issues, such as the presence of arsenic, nitrates or salt intrusion.

Despite its abundant fresh water, British Columbia has had a history of problems with water quality. For a number of decades, B.C. had the highest reported rate of intestinal illness in Canada, most of which was attributed to the consumption of contaminated water. Between 1980 and 2000 there were 29 confirmed waterborne disease outbreaks in communities in B.C. However, since our reports on Health Goals in 1999 and on Drinking Water in 2000, major legislation, along with a program of stepped up monitoring, management and protection, has been implemented in B.C.

Two indicators to measure water quality have been used in this section. One is the number of boil-water advisories, which inform all consumers on the water system that the drinking water may be contaminated. The other is the Water Quality Index (WQI), which measures for a limited number of water bodies the degree to which the various water uses are protected, threatened or impaired. (The number of waterborne diseases and waterborne outbreaks are discussed under Goal 6.)

While water quality index and the number of boil-water advisories are useful indicators, they have limitations in terms of completeness and timeliness. As we noted in our report, *Drinking Water Quality: The Public Health Perspective*, sufficient accurate information is essential to the management and control of water quality. The patchwork of information about disease outbreaks, boil-water advisories and water quality statistics needs to be augmented by a comprehensive database that reports on the characteristics of all water systems, their performance and the occurrence of all water-related illness.

DRINKING WATER QUALITY IN B.C.: THE PUBLIC HEALTH PERSPECTIVE

The Office of the Provincial Health Officer focused its 2000 Annual Report on the issue of drinking water quality in B.C. Released in the fall of 2001, the comprehensive 147-page report built on issues raised by Office of the Auditor General and other government ministries. It outlined eight key messages as well as 32 recommendations to improve drinking water quality and control in the province.

Some of the findings will be highlighted here in this report. Many of the report's recommendations have been addressed under new drinking legislation that was enacted in 2003.

The full text of the report can be accessed at http://www.healthplanning.gov.bc.ca/pho/pdf/phoannual2000.pdf

What Do The Indicators Show?

- Of the 33 water bodies monitored for water quality in 1998/99, 17 were rated good or excellent, 14 were rated as fair, indicating some impairment and the need for actions to prevent further impairment, and 2 were rated borderline because of high mineral content. No water bodies were rated as poor.
- Trend assessments of water quality at 47 surface water sources monitored over the last decade showed that 17 are improving, 25 are experiencing no change, and 5 are deteriorating (MWLAP, 2002).
- In 2002, B.C. had 338 boil-water advisories up from 241 advisories the year before.
- The number of boil-water advisories has increased by 38.5 per cent since 1995 but the number of small water systems has also increased tremendously over the same period of

NEW LEGISLATION SAFEGUARDS DRINKING WATER IN B.C.

After widespread consultations, in May 2003 new drinking water legislation came into force in B.C. The *Drinking Water Protection Act* puts in place many of the recommendations made by the Provincial Health Officer in the 2000 Annual Report, particularly a multi-barrier approach to water safety. The legislation is outcome-based, not prescriptive, giving public health officials ultimate authority and flexibility to determine the safety of the water. Under the legislation:

- Drinking water safety is a public health issue and the B.C. Ministry of Health Planning is the lead agency responsible for water protection.
- Source-to-tap assessments will be conducted for every drinking water system in the province to identify, anticipate and manage potential health risks on the system.
- 20 new drinking water officers who are health officials will be employed by the regional health authorities to oversee water quality.
- Non-transferable operating permits will be required for each system that specify monitoring requirements on a case-by-case basis.
- New owners must apply for a new permit, ensuring they are aware of the regulations and of the requirements for their system.
- All water system operators must be officially certified with no "grandfathering" of long-term staff.
- Lab findings of *E.coli* or fecal coliforms in water supplies trigger immediate notification of the drinking water officer, medical health officer and water supplier (avoiding Walkerton's problem in which only the water supplier was notified).

The Provincial Health Officer feels these new requirements will help improve the drinking water quality in B.C.

time. For example, 500 more small water systems came on stream between 1996 and 2000. The majority of advisories are on systems that serve between 15 and 5,000 people and affect less than one per cent of the B.C. population.

- An estimated 65 per cent of the advisories were issued to water systems that supply untreated surface water, warning users of the potential existence of contaminants, and not because contaminants were actually found in the water.

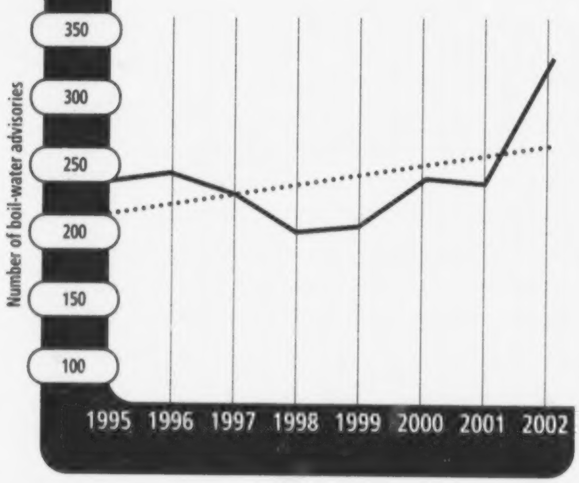
Water Quality Index

In general British Columbia's water quality is improving. Of the 64 waterbodies monitored in 1997, 19 per cent were rated excellent or good, 66 per cent were fair and 15 per cent were poor. In 1998/99, of the 33 waterbodies measured, 51 per cent were excellent or good and none were poor.

The number of waterbodies tested has declined, decreasing from 124 in 1995 to 33 in 1998/99. Nevertheless, efforts are made each year to ensure that those chosen for testing reach a substantial proportion of the population. The number of waterbodies monitored each year differs depending on the resources made available. However, significant increases in budgets for monitoring were made available by government beginning in 2002/03. Therefore, it is expected that when these data are reported, the number of waterbodies with reported water quality indices will increase considerably (L. Swain, personal communication, December 20, 2002 & July 31, 2003).

FIGURE 5.3

Number of boil-water advisories, B.C., 1995 to 2002



Source: Health Protection, B.C. Ministry of Health Planning. Prepared using the Health Data Warehouse (2003 April), B.C. Ministry of Health Planning and B.C. Ministry of Health Services.

Boil-Water Advisories

Advisories to the public to boil their water are increasing over the years (see Figure 5.3). Reasons for this increase include better identification and enforcement efforts, as well as the existence of surface water systems in communities that do not treat or disinfect the water with chlorine.

Boil-water advisories are issued by the water supplier or by order of the medical health officer under any of the following circumstances:

- Tests reveal the presence of fecal coliform or that total coliform counts exceed regulated limits.
- Any time a waterworks system using surface water or shallow wells does not disinfect their water supply.
- An elevated health risk exists because of a water system or treatment failure.
- Evidence exists of improper or irregular operation or maintenance of a water system.
- High turbidity exists in source or supplied waters.
- Medical reports of gastrointestinal illness raise suspicion of a possible waterborne disease or outbreak.

In 2002, 338 boil-water advisories were issued. Previous year's experience showed that 65 per cent of them were because the water system was supplying untreated water. As we noted in the 2000 Annual Report on drinking water, the high number of advisories is a result of many factors including: numerous small water systems without an identifiable supplier taking responsibility for proper water delivery; lack of funding for infrastructure upgrades and training on small systems; and community aversion to chlorine and chlorination by-products in water.

For example, Kootenay Boundary region has traditionally had a higher number of boil-water advisories than other regions because of its large number of small water systems using untreated surface supplies which are susceptible to contamination (Health Data Warehouse, 2002).

Where Do We Go From Here?

As in 1999, the long-term target is to continually reduce the risks from drinking water and to reduce the need for boil-water advisories. Current treatment methods, such as chlorination, are economical and effectively deal with *E.coli* and fecal coliform, but do not always neutralize hardy parasites like *Giardia* and *Cryptosporidium*. As noted in the 2000 Annual Report, there is no way to ensure "zero risk" in drinking water because contamination can occur before testing reveals its presence. By putting in place a multi-barrier approach, however, we can reduce the likelihood that people will be harmed by contaminated water. We can do this by having adequate source protection to try to reduce the introduction of contaminants into the water. We also need adequate treatment methods, including an increased focus on filtration and other advanced forms of treatment, to neutralize and remove contaminants. We require regular surveillance that ensures when contamination is found, it is dealt with and the public alerted to avoid widespread infection. Finally, we must ensure that water system operators are properly trained and certified. Many of these issues are now being addressed under the new *Drinking Water Protection Act*. One of the provisions of the *Act* gives the Provincial Health Officer the ability to recommend to Cabinet that remedial measures be taken when multiple uses in a watershed, such as recreation or cattle grazing, threaten to compromise drinking water quality.

Water treatment beyond simple disinfection is expensive, yet as our 2000 Annual Report clearly stated, to reduce the incidence of waterborne illness, B.C. should be taking steps to upgrade treatment, particularly to deal with *Cryptosporidium* and *Giardia*. The decision to spend millions of dollars on treatment systems is often presented more as political and economic decisions than as a health decision. However, communities and local governments often find political and public willingness to spend money on adequate treatment after they have been hit by a substantial waterborne disease outbreak. From a public health perspective, we should be preventing these outbreaks by employing better treatment before they occur.

Another strategy regarding protection of our water supply is to reduce use. British Columbians were using 60 per cent less water per capita in 1999 than they did in 1983, a figure, which includes domestic, industrial and all other uses. That is about the same per capita use as the Canadian average (638 litres per day). The Prairie provinces use the least water, at 492 litres per day. However, Canadians are among the world's highest water users. About 65 per cent of domestic indoor water use occurs in the bathroom with toilets being the single greatest water user in the home. Only 10 per cent is used in the kitchen and for drinking.

The role of the public and communities in protecting water supplies is growing in importance. Participating in community planning and ensuring that local growth strategies minimize the impacts upon drinking water sources is one way to help protect the water supply. Making collective decisions among governments, industries and communities and acting together on water quality issues is critical. B.C.'s plans to increase monitoring and assessment, with a long-term focus on future infrastructure needs, will help reduce the risks to British Columbians.

What Actions Can We Take?

Individuals:

- Boil your water before drinking if your community has a boil-water advisory.
- Get your water tested if you get it from a private well.
- Participate in community planning and ensure local growth strategies do not adversely impact upon drinking water sources.
- Support the provision of adequate water treatment in your community.

Governments:

- Work collaboratively with industries and communities, and act together on water quality issues.
- Create funding mechanisms and strategic plans for the addition of filtration and advanced treatment methods to improve water quality delivered to the consumer.
- Monitor and evaluate the new drinking water legislation for weaknesses and, where needed, introduce amendments to continually improve water quality in British Columbia.
- Expand the current testing program for surface water bodies.

Food

Food can be contaminated or made harmful to human health in a number of ways – when crops are grown, livestock are managed, or when food is being processed, packaged, handled, stored, prepared or served. Often the public discussion around the safety or quality of our food is highly emotional and has a huge economic impact, such as was witnessed in the spring of 2003 with the discovery of a single cow with Bovine Spongiform Encephalopathy (BSE) – Canada's first incidence of "Mad Cow" disease. While some controversial issues have a potential public health component – such as whether the overuse of antibiotics in food animals is contributing to growing antibiotic resistance – often there is insufficient data or research to make clear associations. The impacts of controversial issues such as genetically modified organisms, fish farming and agricultural use of hormones are subjects of ongoing debate and require further research. The public health impacts of some of these contentious areas; however, are likely of less significance in terms of disease than is the lack of secure access to healthy well-balanced diets.

While the two indicators we use in this section do not deal with the huge array of food quality issues, they do give us a snapshot of a very important part of food safety – how food is being handled and prepared. Food contaminated by improper or unsanitary food handling can lead to serious illness, often of a large number of people. Food safety is an important part of public health protection. The two indicators used are critical hazards found in restaurants and other food facilities, and food samples that exceed guidelines for contamination.

ANTIMICROBIAL RESISTANCE

In December 2000, the Office of the Provincial Heath Officer released *Antimicrobial Resistance: A Recommended Action Plan For British Columbia*. The 29-page report focused on four key topic areas:

- **Surveillance**
- **Case management**
- **Education and awareness**
- **Animal and agricultural use.**

As part of its recommendations, the committee behind the report urged better research and data to deal with the lack of information about the pros and cons of using antibiotics in animals. It also recommended reduced reliance on antimicrobials in food animals and increased monitoring. Full text of the report is available at: http://www.healthplanning.gov.bc.ca/pho/pdf/antimicrobialfinal.pdf

What Do The Data Show?

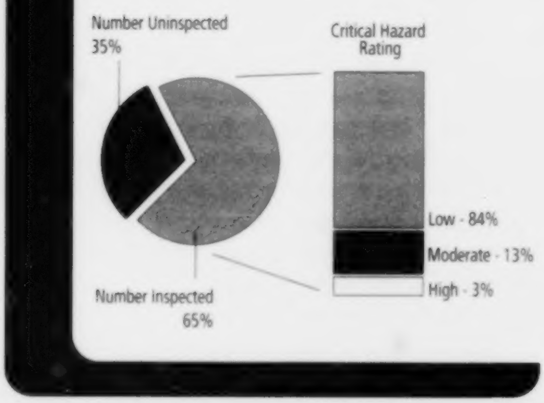
- A higher percentage of inspected restaurants received a high critical hazard rating. In 2001, 3 per cent of licensed food establishment that were inspected received a high critical hazard rating, compared with 2 per cent in 1998/99.
- Testing of food samples (both routinely and of food suspected of mishandling) found similar proportions meeting safety guidelines as in previous years. However, there is room for improvement as a consistent proportion – about one third - exceed one or more guidelines.
- 80 to 85 per cent of food establishments with high critical hazards had corrected the problem by the follow-up inspection. Variability in follow-up correction in different health regions needs to be addressed.

Critical Hazards In Food Premises

Unsafe handling of food or unsanitary conditions in eating establishments can introduce or transmit serious contaminants. Certain pathogenic organisms such as *Campylobacter, Salmonella, Listeria* and *E.coli* are spread primarily through food. Regulations and codes of practice govern food preparation in eating establishments and help reduce the risk of illness when food is consumed. Routine inspections are undertaken in restaurants, bars, institutions, hospitals, small corner stores, major supermarkets, slaughterhouses and food manufacturing plants.

The 1999 Annual Report found that critical hazards were identified at a rate of 54 hazards for every 100 facilities, following inspection of 16,954 facilities. The ten previous years recorded rates ranging from 54 to 80 critical hazards per 100 facilities for a consistent rate of about 50 per cent. However, some of the hazards would be more serious than others. In 2000/01, it was decided to focus the indicators only on those critical hazards that are rated high, meaning the

FIGURE 5.4 **Food establishments inspected and their critical hazard ratings, B.C., 2000/01**



Source: Business Planning, Surveillance and Epidemiology, B.C. Ministry of Health Planning.

presence of health hazards that require immediate attention. Applying this standard to earlier test results, the proportion drops from 50 per cent to a consistent two to three per cent.

In 2000/01, there were 27,374 food establishments licensed in British Columbia, of which two thirds were inspected. Of all that were inspected, 3.0 per cent received a high critical hazard rating (see Figure 5.4). These hazards could be a result of inadequate refrigeration, improper cleaning of equipment, or problems with food handler hygiene. In 1998/99, a smaller proportion (2 per cent) was rated high on the critical hazard rating.

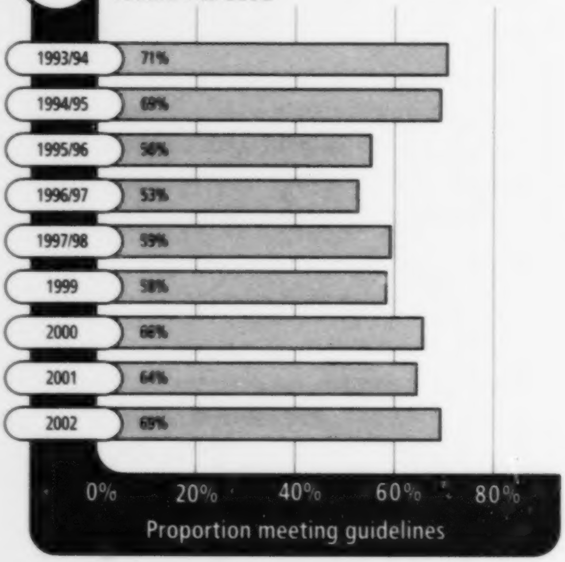
The public has a right to know about the ratings of various restaurants. A positive step in keeping the public informed is the trend toward posting the results of food service inspections on Web sites. The Vancouver Coastal Health Authority launched a Web site in 2002 where the public can view details of the most recent inspections of food service establishments in Richmond and Vancouver. It was developed in response to public demand and with the input and cooperation of foodservice industry associations, and is to be updated weekly. In Vancouver and Richmond, public health inspectors (or environmental health officers) carry out more than 12,000 inspections of food facilities annually, visiting more than 4,000 food service establishments and 1,500 food retailers. The Web site is available at http://www.foodinspectionweb.vcha.ca/

Food Quality Samples Meeting Guidelines

Samples of food are collected as part of routine testing program or when unsafe practices (for example, food left out of temperature-controlled storage) are observed by Environmental Health Officers. As foods are generally sampled because the Environmental Health Officer deems them "riskier" than average, the results are not representative of the overall quality. Types of food samples chosen for testing include meats, dairy foods, baked goods, salads and seafood. In most years, about 60 to 70 per cent of the samples fall within the safety standards and fall within all the food quality check guidelines. No difference was noted in 2002. Of 555 cooked, ready-to-eat samples tested in 2002, 69 per cent met all the requirements of the quality checks (see Figure 5.5).

Thirty-one per cent of cooled, ready-to-eat foods sampled under the food quality program in 2002 exceeded one or more guidelines. These samples were taken because they were deemed riskier, either by their nature or because of observed handling practices. It is therefore, not a good indicator of the overall food supply. Instead, the results illustrate that safe food handling must be continually stressed and promoted to all food handlers.

FIGURE 5.5 **Proportion of cooked, ready-to-eat samples tested that meet guidelines, B.C., 1993/94 to 2002**



Source: B.C. Centre for Disease Control

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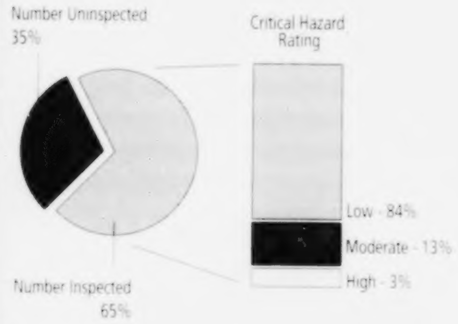

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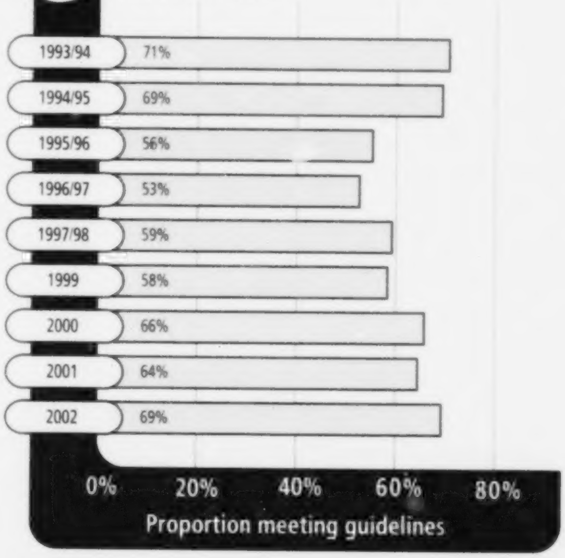


Source: B.C. Centre for Disease Control

As we discussed in the 1999 Annual Report, one way of estimating the levels of chemicals to which Canadians are exposed is through the "total diet survey". Health Canada began these surveys in 1969 by randomly collecting food samples of a typical Canadian diet from grocery stores across Canada, preparing them as consumers would, and then testing them for contaminants. The foods are tested for lead, dioxins, heavy elements and pesticides. Scientists then estimate the amounts of contaminants Canadians are likely to consume in their total diet.

Health Canada continues to perform the Total Diet Study but results are not generally made widely available unless a problem is found. Some sectors of society have been lobbying that the information be routinely made public. Environmental Defence Canada obtained results of recent total diet surveys through an Access to Information request and made them public in May 2003, reporting that lead is present in common foods ranging from raisins and muffins to peaches and wine. Cadmium was found in foods such as peanuts, cabbage, celery and potato chips. Health Canada responded, however, by noting these are trace amounts and not likely to harm human health.

FoodWatch, an information watchdog, has used Access to Information processes to get the results of the Total Diet Study data from 1992 to 1996; they are lobbying federal Minister of Health Anne McLellan to continue the Total Diet Study and to make results publicly available. The Provincial Health Officer favors the continuation of the studies and full disclosure of the results. In addition, we need to extend surveillance to additional food items such as testing for mercury in fish. The Canadian Food Inspection Agency does these tests and again, the results should be made much more widely available. In general, food quality monitoring should be augmented and improved.

MEAT INSPECTION

Ensuring food safety for the consumer requires looking at more than just the final stages of food preparation and handling. Outbreaks of infections associated with meat processing have received much attention recently, most notably Jacob-Creutzfeld disease in the UK (from ingestion of meat from BSE-infected cows), and *E. Coli* and *Salmonella* infections in Canada and the U.S. These outbreaks result from improper slaughtering of animals and poultry, and subsequent distribution of contaminated meat products.

To protect B.C. consumers from similar infections, it is important to have regular and thorough inspections of slaughterhouses throughout the province. Currently in B.C. slaughterhouses fall under federal, provincial (in defined "meat inspection areas"), and regional or municipal authorities. Inspections are carried out by federal agents (from the Canadian Food Inspection Agency), by inspectors from local public health authorities, or by local veterinarians, with varying degrees of frequency and rigour.

In order to ensure that all meat products available for sale in B.C. meet the same standards for food safety, it is recommended that the entire province be declared a meat inspection area. This would allow for a uniform inspection system affecting all slaughterhouses in the province. Slaughtering for personal use (i.e. meat not for commercial resale or use) would be an exception from this requirement.

Where Do We Go From Here?

All food establishments in B.C. should receive an inspection once yearly. However, for efficient use of resources, public health protection efforts are geared towards high-risk food establishments. "High-risk" refers to food establishments that have an increased risk of causing an outbreak of illness because they handle potentially hazardous products, serve a large number of people, or serve a high-risk community such as hospitals and community care facilities where people are usually sick or in poor physical health. In 2000/01, Simon Fraser and Central Vancouver Island HSDAs were able to conduct inspections of all high-risk food establishments. Vancouver/Richmond HSDA was also able to conduct inspection of 90 per cent of high-risk food establishments in that year. In contrast, achieving higher targets for routine inspections are difficult for HSDAs with more rural communities. For example, only 22.6 per cent of all food establishments and 13.6 per cent of high-risk food establishments in the North West health region were inspected.

One hundred per cent correction of identified critical hazards should be achieved by the time of the follow-up inspection. Although typical correction rates are around 80 to 85 per cent for most health regions, variability in correction rates exists and needs to be addressed.

What Actions Can We Take?

Individuals:

- Practice safe food handling and storage practices. (Visit the following Web sites for more information: http://www.bchealthguide.org/healthfiles/index.stm and http://www.hc-sc.gc.ca/english/iyh/food/)
- Persons who prepare food for others (at work, or in the community) should take a FOODSAFE course (for information see http://www.c2t2.ca/curric/foodsafe/index.htm).

Food establishments:

- Ensure food handlers complete food safety programs such as FOODSAFE.
- Develop a food safety management plan and record corrective actions to minimize the risk and impact of foodborne illness associated with your product.
- Be aware that if insufficient attention is paid to storing, cooking and serving your food and cleaning and sanitizing your utensils according to FOODSAFE standards, it can result in potential harm to your customers and your business.
- Health authorities should also be rigorous in their inspection efforts and follow best outcome practices. All Health Authorities should post the results of restaurant inspections on their Web sites.

Land and Soil

The quality of our land and soil can pose public health risks when it is contaminated with heavy metals, toxic chemicals or naturally occurring toxic substances. Pollution sources include industries, agriculture, development like road-building or garbage disposal and atmospheric deposition. Contaminants deposited on soil pose a risk when they are accidentally ingested – typically through hand to mouth contact by children or if soil contaminants migrate into drinking water supplies.

As we noted in the 1999 Annual Report, we do not have indicators that provide an overall assessment of soil quality or land degradation. However, during the late 1980s and 1990s, it was discovered that blood levels of lead in the children of Trail posed a public health hazard, primarily from airborne particles deposited on soil. This indicator can give us a picture of our progress in a small, defined area of the province.

What Do The Data Show?

- Blood lead levels of children in Trail have steadily declined in recent years but remain at an elevated level when compared with average rates of blood lead levels in children in other cities.
- While more than 90 per cent of children in 2001 were below the Trail level of concern of 15 micrograms per deciliter (µg/dL), the goal has been set for 2005 to have at least 90 per cent of children with blood lead levels less than 10 µg/dL and 99 per cent of children with blood lead levels under 15 µg/dL.

Blood Lead Levels In Children

The city of Trail in the east Kootenays has been the site of smelting operations since the early 20th century. For years, emissions from the smelter deposited lead in the soil and house dust of the community, long before scientific understanding emerged of the hazards of excess lead exposure. Lead poisoning causes developmental disorders, learning disabilities, behavioral problems, sight and hearing deficits and brain damage, but subtle impacts can occur at lower levels of exposure similar to those in Trail. Young children three years and under are highly susceptible because they are more apt to put their hands and objects in their mouths, thus ingesting the lead from the soil.

A 1989 study found that 39.4 per cent of children tested were above the U.S. Environmental Protection Agency's "level of no concern" of 15 µg/dL at the time. As a result, a co-operative, multi-stakeholder Trail Community Lead Task Force was struck in 1990, which focused primarily on community education and blood level testing assessment. Along with advising parents on how to avoid lead exposure by ensuring frequent handwashing of their children, by damp mopping of the homes and by avoiding of areas with bare soil, a new lead smelter was also installed in 1997 that greatly reduced emissions.

In our 1999 Annual Report, we noted then that average blood lead levels for Trail children had declined over the decade, due to the preventive measures and in particular the new smelter which greatly reduced lead concentrations in the air. In 1991, 42 per cent of children had blood levels higher than 15 µg/dL but this proportion had declined to just 6 per cent by 1999. The next community survey for all age groups will be in 2005.

The community finds the current levels of blood leads and risks from other heavy metals acceptable as long as there is a continuing concerted effort to reduce exposure as much as possible. The current Trail Health and Environment Committee is monitoring the implementation of the Task Force recommendations. Future decrease will be achieved through further source reductions based on available technology and better control of fugitive emissions.

Sustainability

Our long-term health and well-being depends a great deal on how careful we are about using natural resources and exploring less damaging ways to interact with our physical environment. Sustainability is a concept that has been difficult to define, but the World Commission on Environment and Development (1987) in its findings (known as the Brundtland Report) stated that sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. As we noted in the 1999 Annual Report, sustainable development is about responsible use of all society's resources: natural, human and economic.

This section continues to follow three indicators: greenhouse gas emissions; total and per capita energy consumption; and amount of B.C. land in protected areas.

What Do The Data Show?

- Per capita emissions of greenhouse gases in B.C. decreased by 6.3 per cent between 1990 and 1999. However, total emissions increased by 20 per cent over the same time period, partly due to population growth and to emissions from vehicles (MWLAP, 2002).
- The transportation sector is the single largest source of greenhouse gas emissions in B.C., accounting for 42 per cent of the total emissions.
- Per capita energy consumption in B.C. is slowly declining and total energy use is starting to level off. Evidence is emerging that diversification of the economy, particularly shifts to tourism industry and high-tech industry, results in lower energy consumption.
- B.C. has set aside 12.5 per cent of its land base in protected areas, exceeding the international recommendation. However, some areas are underrepresented. Marine ecosystems have a protected area status of 1.2 per cent and northern areas have less than 1 per cent of the land base protected.

Greenhouse Gas Emissions

Gases such as carbon dioxide and methane are called greenhouse gases. As they build up in the atmosphere, they act like the transparent roof of a greenhouse, trapping the heat from the sunlight that shines in (MWLAP, 2002). The results are an increase in global air temperature and changes in the climate. Climate changes pose health risks even to healthy people. Higher temperatures may lead to a higher incidence of heat stroke, particularly among children and the elderly. It is speculated that we will become more susceptible to insect-borne diseases because of increased precipitation and temperature, which may increase the range and breeding ability of disease carrying insects like mosquitoes. Higher temperatures may also raise the concentrations of ground-level ozone, leading to increased asthma and respiratory difficulties. While the above impacts may

BRITISH COLUMBIA AND THE KYOTO PROTOCOL

The 1997 Kyoto Protocol, once in force, commits ratifying countries to reduce their greenhouse gas emissions. Canada's Kyoto target is to cut emissions to 6 per cent below 1990 levels by the period 2008-2012. B.C. is preparing a provincial climate change strategy encouraging the use of clean, renewable energy, greater efficiency in energy use, and a reduction of emissions in the industrial and transportation sectors.

There are concerns, however, that the agreement will have a disproportionate economic impact on B.C. and Alberta because of their economic base in the natural gas and forest industries. Indeed, B.C. is known as a "carbon sink" because of the role its forests play in reducing carbon dioxide. The B.C. government wants energy credits if the federal government is intent on using B.C.'s forests to reduce Canada's overall burden of Kyoto commitments (Premier Campbell, October 22, 2002 letter to Prime Minister Jean Chretien).

The government of Canada released the Climate Change Plan for Canada in 2002, outlining how it will meet the greenhouse gas reduction targets set under Kyoto. It includes a suggestion that each Canadian can set a personal goal to reduce emissions by an average of one tonne per year by 2008-2012. See www.climatechange.gc.ca.

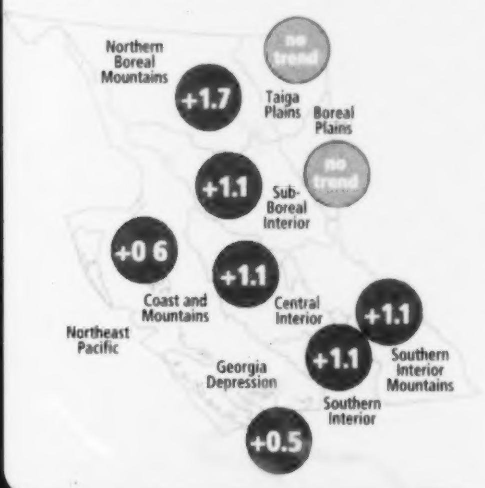
be subject to debate, one clear implication of global warming is the rise of sea level. This will have serious implications for coastal flooding and, among other issues, potential drinking water contamination.

Within British Columbia, the average air temperature has increased in the last century, with the rural areas experiencing a greater change in average air temperature than the urban areas. Figure 5.6 shows the change in average air temperature in degree centigrade per century.

Megatonnes of carbon dioxide (CO^2) equivalent is the unit to measure greenhouse gas emissions. Major sources of greenhouse gas emissions include transportation and industry. In B.C., per capita greenhouse emissions have decreased over the last decade (by 6.3 per cent) but total greenhouse gas emissions have increased to 63.5 megatonnes of CO^2 equivalent in 1999, or 20 per cent since 1990.

FIGURE 5.6

Average air temperature change in degree centigrade



Source: B.C. Ministry of Water, Land and Air Protection. Data from Environment Canada. Analysis by Canadian Institute for Climate Studies, 2001.
http://wlapwww.gov.bc.ca/soerpt/pdf/ET2002Oct221.pdf

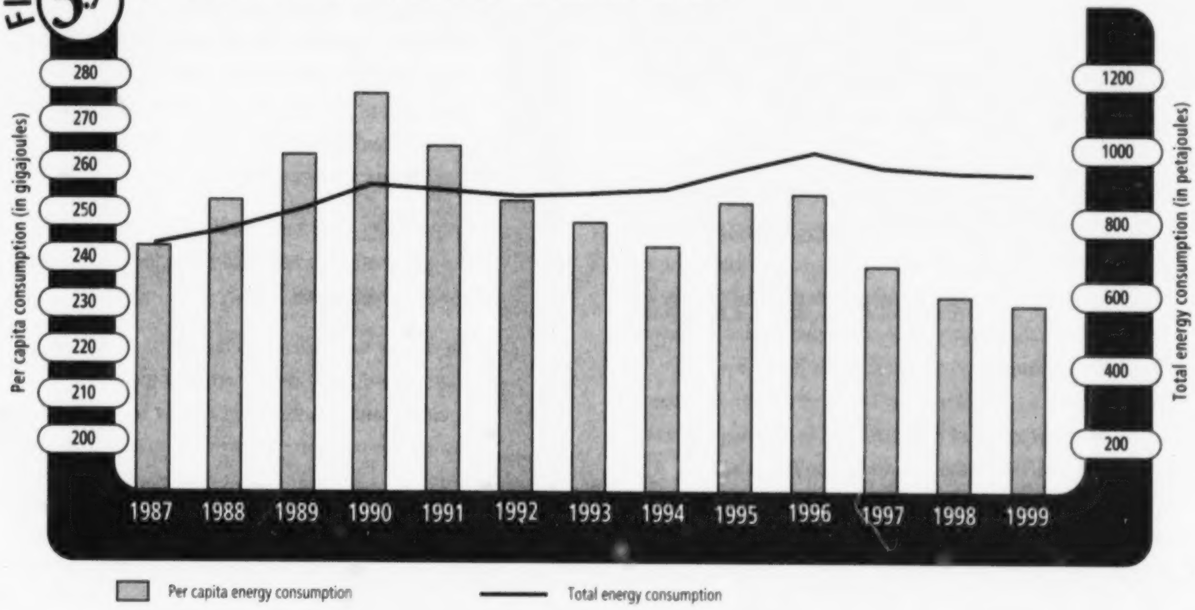
Energy Consumption

Canada uses more energy per capita than most countries. Factors that contribute to our high level of energy use include large distances that encourage car use, size of the country relative to population density, cold climate, energy-intensive industries and relatively competitive energy prices. For the province over the last five years, per capita energy consumption is slowly declining and total energy consumption is starting to level off (see Figure 5.7).

There is evidence that intensity of conventional energy used (by indexing against the 1981 Gross Domestic Product) has improved as the British Columbia's economy starts to diversify, moving away from resource-based extraction and manufacturing towards less energy intensive industries, such as the tourism industry and high-tech industries. In fact, the high-tech and other clean industries are now the largest employers in all regions of the Fraser Basin, which accounts for 80 per cent of the province's economy (Fraser Basin, 2003). However, many communities in this province are primarily dependent on heavy industries to provide jobs and incomes.

Environmentally-friendly energy alternatives are emerging as new sources of energy, helping B.C. to remain sustainable. Sixteen per cent of our total energy consumption is from alternatives such as biomass, solar, wind and small hydroelectric generators, and fuel cells. B.C. Hydro plans to add new "green" energy technologies to meet 10 per cent of its load growth over the next decade, and an energy policy framework is being developed for B.C. that will include specific reference to environmentally sound energy supplies, and alternative energy sources.

FIGURE 5.7 Per capita and total energy consumption, B.C., 1987 to 1999



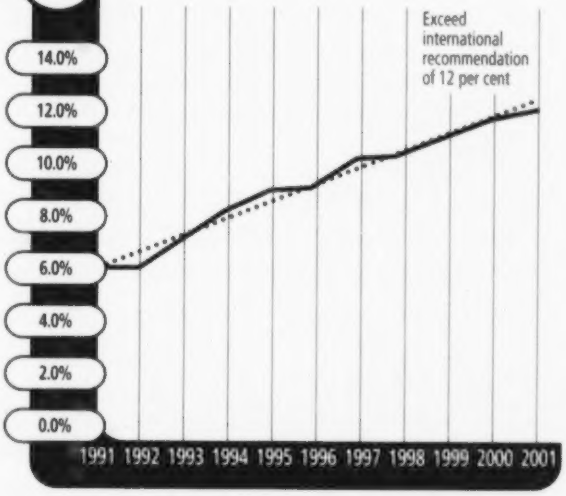
Sources: B.C. Ministry of Water, Land and Air Protection. Statistics Canada (CANSIM) and BC STATS (BC Economic Accounts). http://wlapwww.gov.bc.ca/soerpt/99economy/energyglance.html. Population estimates from BC STATS, B.C. Ministry of Management Services. Per capita data prepared using the Health Data Warehouse, (2003 April), B.C. Ministry of Health Planning and B.C. Ministry of Health Services.

Land In Protected Areas

Eight per cent of Canada's land is protected (Statistics Canada, 2000 June). Protected areas refer to land and water areas that are legally established, regulated and managed for conservation. In ten years, the land base in B.C. dedicated to protected areas grew from 6.1 per cent in 1991 to 12.5 per cent (11.86 million hectares) by the end of 2001 (see Figure 5.8). While this exceeds the international recommendation of 12 per cent, the ongoing challenge is to ensure a wide range of appropriate ecosystems is represented. This is improving, with 37 per cent of the province's 100 terrestrial ecosections (representing different ecosystem types) having at least 12 per cent of their area protected. Marine ecosystems, however, remain poorly represented, with protected area status of just 1.2 per cent. As well, the most northern reaches of the province, and the northeast, also have less than 1 per cent protected. A provincial objective is to increase the protection of ecosystem diversity.

British Columbia is facing a number of biodiversity challenges that reflect the difficulties of maintaining a sustainable land base in a developing province. B.C. ranks third among provinces and

FIGURE 5.8 Land in protected areas, B.C.,1991 to 2001



Source: B.C. Ministry of Water, Land and Air Protection. http://wlapwww.gov.bc.ca/soerpt/1protectedareas/percentglance.html territories for the number of species ranked nationally as "at risk" or "may be at risk". A variety of habitats critical to protecting biodiversity are endangered, including the southern Vancouver Island Garry Oak Woodlands, while wetland cover in the Lower Fraser Valley and B.C.'s old growth forests are under development and resource extraction pressure.

Protecting land in its natural state means protecting the natural diversity of ecosystems, fish and wildlife species and their habitats. This must occur hand in hand with appropriate legislation and sufficient conservation resources. British Columbia has the highest number of species designated "at risk" of any other province in the country. Fifty-two native species are known to be at risk and another 56 are classified as "may be at risk" (MWLAP, 2002). B.C.'s ranking may be due in part to its concerted effort to assess the status of its species and to its being home to more species than most other provinces. Having enough conservation officers to enforce fish and wildlife anti-poaching and other environmental laws will also help to prevent more species from becoming endangered.

Where Do We Go From Here?

Reducing greenhouse gas emissions has to be a conscious long term effort. Canada's commitment to the *Kyoto Protocol* will mean the province and country have to be more conscientious in reversing the trend.

Anticipatory planning to mitigate the impacts of climate change should also start (for example, impact of rising sea levels).

The longer we depend on conventional energy sources and delay the investment and development of alternative energy technologies, the sooner our natural resources will deplete.

What Actions Can We Take?

Individuals:

- Reduce the use of single-occupancy vehicles, by walking, bicycling or using public transportation.
- Participate in community planning and local growth strategies.

Governments:

- Promote measures to reduce greenhouse gas emissions and promote the use of alternative fuels.
- Communicate issues related to sustainability of the physical environment and their impacts on human health.
- Continue efforts to protect lands that reflect the full diversity of B.C.'s ecosystems.

HEALTH GOAL 4

CHAPTER 6

Health Services

GOAL 4: HEALTH SERVICES

Accessibility

Childhood immunization – *Not much change*
Influenza immunization – *Improving*
Screening mammography – *Improving*
Pap smears – *Not much change*
Smoking cessation services – *Improving*
Dental visits in past year – *Not much change*
Unmet health care needs – *Worsening*

Doing The Right Things Right

Opportunities for self-care – *Improving*
Use of protocols and guidelines – *Improving*
Breast-conserving surgery – *Not much change*
Caesarean deliveries – *Worsening (rate increasing)*
Antibiotic prescribing – *Not much change*
Preventable admissions to hospitals – *Improving*
May not require hospitalizations – *Improving*
Expected compared to actual stay – *Improving*
Alternate level of care days – *Worsening*
Community follow-up after hospitalization – *Not much change*

Improving Health

Deaths due to medically-treatable diseases (ASMR) – *Improving*

An effective and efficient health service system that provides access to appropriate services.

As we have seen from earlier chapters, attaining and achieving good health depends on a wide variety of factors, of which standard health services – such as doctors, hospitals, medications and treatments are one part. That part, however, is an important one. Quality health services, when we need them, make an essential contribution to our health and well-being. Having access to effective immunizations to prevent disease, getting the right surgery or the right prescription, or obtaining the type of care we need can not only improve our health or quality of life, it can often save our lives.

However, unnecessary or ineffective health care can harm our health, even cause premature death, and can use a great deal of public resources that could be better spent elsewhere to enhance health.

As we noted in the 1999 Annual Report, the provision of health services comprise the single largest expenditure for the provincial government. In 2002, its annual cost was $10.4 billion and represented 41 per cent of provincial budget. That was up from $8 billion and 36 per cent of the budget in 1999. The pressure to increase funding for health care is intense. It is essential, therefore, that we examine whether the money we are spending and the health services we are providing translate into improved health. Are the people who need services getting them? Are the right services being provided? Are cost-effective programs, like immunizations, readily available to reduce and prevent the incidence of infectious illness?

Health Goal 4 examines three aspects of health system performance:

- **Accessibility** – Are services available, accessible and reaching those who can benefit from them? Indicators used to determine accessibility are childhood immunization, flu immunization, screening mammography, Pap smears, dental visits, smoking cessation and unmet health care needs.
- **Doing The Right Things Right** – Are we providing the right service in the right place at the right time with the right provider? Indicators are self-care, protocols and guidelines, antibiotic prescribing, breast-conserving surgery, caesarean deliveries, preventable admissions and hospitalizations, alternative level of care days, community follow-up for mental health.
- **Improving Health** – Are the health services leading to improved health? Indicators are age standardized mortality rate and deaths due to medically-treatable diseases.

These three categories, and the indicators used to assess them, represent only a small portion of all the possible aspects and indicators that could be examined to evaluate health services performance. Fortunately, over the last five to ten years, many organizations, governments and research institutions are taking more in depth examinations of the quality and effectiveness of our health care systems.

In Chapter 1, we referenced some of the national, provincial and regional sources for more in depth information about various health services performance targets, indicators, and outcomes. A set of performance indicators for health services have been established in the B.C. Ministry of Health Services and B.C. Ministry of Health Planning yearly Service Plans, found on the ministries' Web sites (www.healthservices.gov.bc.ca and www.healthplanning.gov.bc.ca). Performance indicators for health services have also been established in each of the Regional Health Authorities annual Performance Contracts. These contracts are found on each of the health authorities Web site via a single portal at www.healthservices.gov.bc.ca/socsec

Accessibility

Accessibility is one of the fundamental principles of the Canada Health Act. Providing access in a province as geographically immense and diverse as British Columbia can be a continual challenge. Nevertheless, British Columbia is faring relatively well on some measures of access. According to the Health Services Access Survey 2001, 90.2 per cent of British Columbians have a regular family physician, compared to 87.7 per cent of Canadians (Statistics Canada, 2002 June). Ninety per cent of those with a regular family physician reported quality of care to be "excellent" or "good".

There are other measures of access, such as the number of people who receive a certain service, those who have hip or knee replacements or have cardiac operations each year in the province. These sorts of procedural rates are among the nationally comparable indicators now being reported on by all the provinces. However, as we noted in the 1999 Annual Report, these types of utilization rates cannot tell us whether or not the procedure was necessary nor tell us what the ideal or the most desirable rate should be.

More health service is not necessarily better care. In fact, a growing body of research is finding that while access to more doctors and more hospitals leads to more health care intervention, it does not necessarily lead to better outcomes, better health or longer life (Fisher et al., 2003, Shine, 2003, Phelps, 2003, Wilensky, 2003). In addition, the growing evidence of the frequency of unintentional medical error, as described in more detail in this chapter under "Doing the Right Things Right", also sounds a note of caution about carefully weighing the risks and benefits of all medical care.

In this report, as in the 1999 Annual Report, we follow trends in access to four well-established and highly effective health services that have been proven to improve the health of the population: immunizations, specific cancer screening, smoking cessation services and regular dental care.

What Do The Indicators Show?

- B.C. continues to have fewer than the recommended number of people being immunized. Contributing factors may be under reporting, personal choice, lack of knowledge, or lack of easy access. About 81 per cent of B.C. children are reported to receive the recommended vaccines by two years of age in 2002. However, the target is to have 97 per cent of children immunized.

NEEDS-BASED FUNDING

Up until 2002, funding to B.C.'s health regions was typically but not entirely based on historic patterns. In some years, funding was adjusted for differences in socio-economic and health status of the different regions.

In 2002, the government introduced a new funding formula that takes into account the number of elderly people in the region, the relative socio-economic class, the remoteness of the location and the health status of the population along with other demographic features. This formula then helps the provincial government allocate funds to better reflect the actual need for health services and the costs of providing those services.

- Flu immunization rates are increasing. An estimated 71 per cent of seniors 65 and older in the community receive influenza immunization. Rates are better in care facilities, with 85 per cent of residents being immunized.
- A regular Pap test is an effective way to catch earlier stages of cervical cancer and an estimated 75 per cent of targeted women make use of this free service. More Aboriginal women, recent immigrant and low-income women need to be encouraged to participate. Recent research has implicated the human papilloma virus (HPV) as the cause of the majority of cervical cancers. The prospect of both an effective test and a vaccine hold out promise to further decrease cervical cancer rates.
- There are increasing opportunities for B.C. residents to access smoking cessation programs, either through their family doctor, the B.C. Cancer Agency or the B.C. Ministry of Health Planning.
- Good dental care is associated with better overall health but only 60 per cent of B.C. families make regular visits to the dentist. As we noted in the 1999 Annual Report, the cost of dental care is a major deterrent for low-income families. Recent developments include an annual day in which B.C. dentists provided free care to low-income working adults.

Childhood Immunization

Vaccination against serious, life-threatening childhood illnesses is one of the greatest public health advances of the last century. B.C. children and infants are routinely vaccinated against nine diseases: diphtheria, pertussis (whooping cough), tetanus, polio, *Haemophilus influenzae* type B, hepatitis B, mumps, measles and rubella (see Table 6.1).

Vaccines against meningococcal and pneumococcal diseases have recently been made available. The meningococcal C conjugate vaccine was available starting April, 2003, to those considered at higher risk for the disease. The vaccine became part of the routine immunization program in July, 2003. Children born as of July 1, 2002, are eligible for the vaccine at 12 months of age. Starting in the fall of 2003, this will also be available to children at age 11 who did not receive it as an infant

The pneumococcal conjugate vaccine was also available starting April 2003, to infants and children 2 to 59 months of age who are considered at higher risk for pneumococcal disease and to all Aboriginal infants and children between 2 to 59 months of age. Similarly, the vaccine will be part of B.C.'s routine vaccine program in the fall of 2003, and will be offered to all infants, starting at 2 months of age, as part of their routine immunization program.

Reported immunization rates for children at two years of age have remained at about 81 to 85 per cent from 1995 to 2002, about 14 per cent below the targeted rate. Concerns over data quality and variations in reporting practices make it difficult to

IMPACT OF ANTI-VACCINE MOVEMENTS

Over the last three decades, anti-vaccine movements have occurred in a number of countries. The vaccine against whooping cough, in particular, was singled out. In Japan, Sweden, the U.K., Ireland, Italy, West Germany and Russia, pertussis vaccination fell below 30 per cent due to fear of side-effects. A review of incidence rates lead by scientists at the World Health Organization found that reduction in vaccination levels were soon followed by significant increases in whooping cough incidence, as much as 100 times higher than countries with 95 per cent coverage. Deaths spiked, too, with 41 deaths in Japan during an epidemic and 38 in Britain. Following the outbreaks, immunization rates typically increased again and the rate of the disease dropped back to its old levels (Gangarosa et al., 1998).

In B.C. since 1997, a new, acellular pertussis vaccine is being used which removes some of the concerns of negative side-effects from the whole cell vaccine. Nevertheless, there are still members of the public who oppose vaccination. The research shows it is important to keep coverage high or there will be a resurgence of serious childhood illnesses.

TABLE 6.1 CHILDHOOD DISEASES FOR WHICH PUBLICLY FUNDED VACCINES ARE AVAILABLE IN B.C.

Childhood Diseases	Immunization
Diphtheria, Pertussis, Tetanus, Polio	At 2, 4, 6, 18 months of age and the final booster at 4-6 years of age.
Measles, Mumps and Rubella	At 12 and 18 months of age.
Haemophilus Influenzae Type B	At 2, 4, 6 and 18 months of age.
Hepatitis B	At 2, 4, 6 months of age. At 11 years of age for those who did not receive the vaccine as an infant.
Meningococcal	At 12 months of age. At 11 years of age for those who did not receive the vaccine as an infant.
Pneumococcal	At 2, 4, 6, 18 months of age.

assess the reasons for these lower than expected rates and have lead to a requirement by the B.C. Ministry of Health Services for better reporting from the Regional Health Authorities. Primary care physicians deliver approximately 50 per cent of vaccines to infants and young children. In the absence of comprehensive electronic health records, collecting information on immunizations from doctors' offices poses major obstacles for complete reporting.

Except for a small minority (2 to 5 per cent), most parents surveyed say they intend to get their children immunized. However, many parents said they do not immunize their children or immunize on time because either their children or themselves were ill. Simply forgetting the schedule is another common reason cited. These are barriers that can be overcome through more convenient clinic times. Parents and providers should also know that there are few medical reasons for delaying immunization because of illnesses (Provincial Health Officer, 1999). New strategies could include automated email reminders to parents.

Influenza Immunization

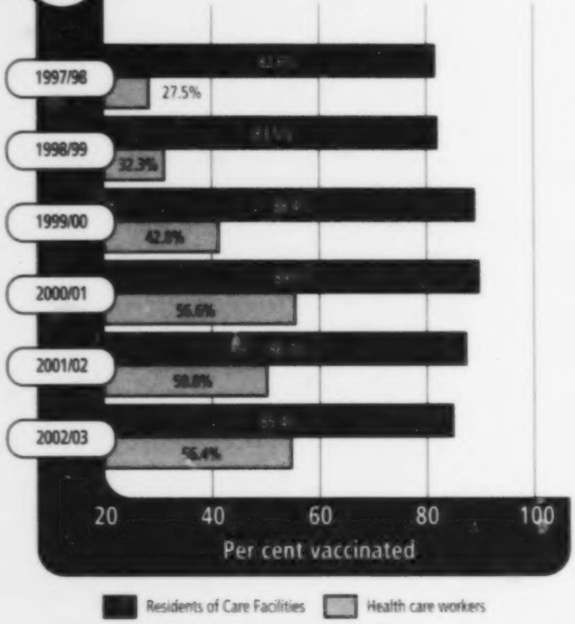
For the elderly, immunization against influenza is proven to be an effective means to prevent flu epidemics and its serious complications – including hospitalization and death. There has been more success in getting seniors, age 65 and older, to be vaccinated against influenza over the years. In 2002/03, an estimated 71 per cent of those living in the community were immunized. The rate was only 55 per cent in 1995/96. However, it still falls below the target of 80 per cent for seniors living in the community.

FLU IMMUNIZATION HELPS REDUCE RISK OF DEATH, HEART ATTACK AND STROKE

U.S. doctors in Minneapolis followed more than 286,000 men and women 65 and older during the 1998/99 and 1999/2000 flu seasons, about half of whom had received flu vaccines. They found that during those two years those who had been vaccinated were 48 per cent less likely to die, 32 per cent less likely to develop pneumonia, 19 per cent less likely to be hospitalized for cardiac care and 16 per cent less likely to suffer a stroke (Nichol et al., 2003).

FIGURE 6.1

Influenza vaccination rates, Residents of care facilities and health care workers, B.C., 1997/98 to 2002/03



Note: For 2000/01 and 2001/02, the vaccination rates for health care workers include staff from acute and long term care facilities. The rates are not directly comparable to other years, which reflect vaccination rates from staff from long term care facilities.
Sources: Data for 1997/98 to 2000/01 - Prevention and Wellness Planning Division, B.C. Ministry of Health Planning. Prepared using the Health Data Warehouse (2002 February). Data for 2001/02 and 2002/03 - B.C. Ministry of Health Planning, unpublished reports.

Coverage is higher among residents of care facilities. Eighty-five per cent were vaccinated in 2002/03, only slightly below the target of 90 per cent in facilities (see Figure 6.1). Although the data include residents of other age groups in these facilities, most residents are seniors. As with childhood vaccination, it is a challenge to collect reliable data about influenza vaccination rates from multiple sites and multiple providers. A more streamlined, computerized data collection system is necessary.

Vaccination among health care workers, who can transmit the virus from one patient or institution to another, can reduce the spread of epidemics. Influenza vaccination for health care workers while strongly recommended, is voluntary. Unvaccinated health care workers present a health threat to vulnerable patients and their exclusion from the health care setting in an outbreak situation may be required. Rates are increasing among health care assess the reasons for these lower than expected rates and have lead to a requirement by the B.C. Ministry of Health Services for better reporting from the Regional Health Authorities. Primary care physicians deliver approximately 50 per cent of vaccines to infants and young children. In the absence of comprehensive electronic health records, collecting information on immunizations from doctors' offices poses major obstacles for complete reporting.

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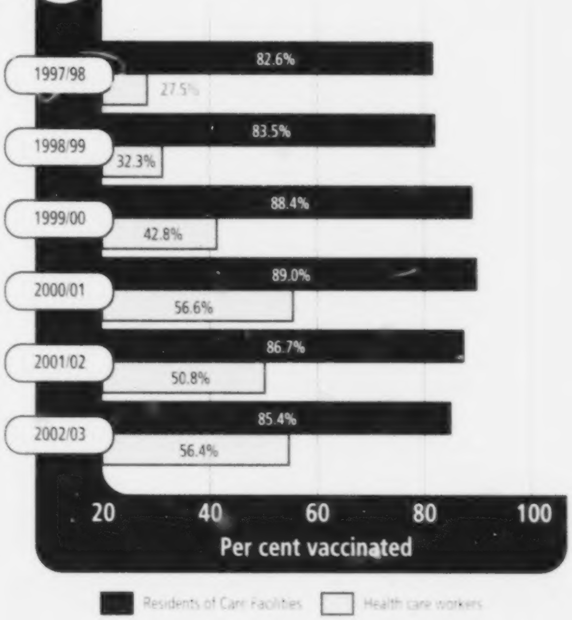

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One brand of flu vaccine was associated with previously unreported side effects in the 2001 vaccine season. These side effects – shortness of breath, wheezing and sore, itchy eyes – were rapidly identified by the B.C. Centre for Disease Control. Manufacturing changes resulted in an improved vaccine in 2002. Side effects in 2001, while not life-threatening and mostly mild, did result in lower vaccine uptake rates. There were negligible side effects reported in 2002.

Screening Mammography

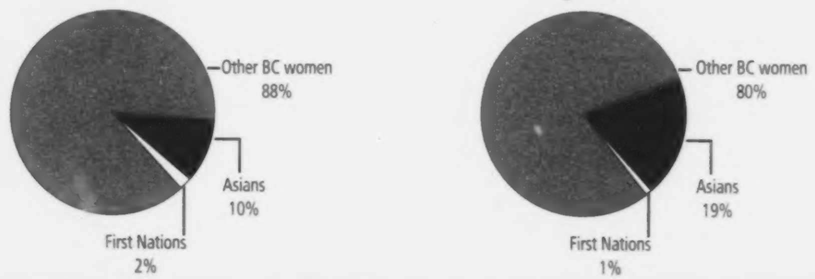
Screening mammography to detect breast cancer in its earliest stages has been shown to save lives when done regularly among women 50 to 75 years of age. The Screening Mammography Program of B.C. has been operating since 1989 and includes mobile services to women in more remote locations. Each year, the program covers more women. In 2001/02, the program provided over 225,000 screens to B.C. women. The participation rate has also increased from 44 per cent in 1998 to 49 per cent in 2001 among women age 50 to 74 years, the target group for whom benefit has been shown. The B.C. Cancer Agency estimates that 95 per cent of B.C. women have access to a mammography screening facility within a 90-minute commute of their home. However, despite the continued increase, we are still far from the recommended 70 per cent participation rate.

As part of the effort to encourage women to participate, the provincial government sends a letter to all B.C. women during the year they turn 50 inviting them to visit their local screening program. One factor underlying the lower than desirable participation rate may lie in the continued high profile scientific debate about the relative merits of mammography screening. The debate has been highly controversial and confusing for both the medical community and women in general. As B.C. Drs. Karen Gelmon and Ivo Olivotto noted in a 2002 editorial in *The Lancet*, "the clinicians and women have been bombarded by media and scientific claims for and against screening mammography." Mounting evidence is showing that screening mammography for women over the age of 50 has a real but modest effect in decreasing the mortality from breast cancer (Nyström et al., 2002). Gelmon and Olivotto conclude that women over 50 should be encouraged to attend.

In May 2002, B.C.'s screening program implemented a "fast track" process. This includes automatic referral for a diagnostic mammogram when a screening mammogram discovers an anomaly. This process was found to reduce the average time to diagnosis, in those not requiring a biopsy, from 23 to six days (Olivotto et al., 2001). For the last decade, B.C. has led Canada with the highest survival rates for breast cancer, with 85 per cent of breast cancer patients alive five years after diagnosis.

FIGURE 6.2

Figure 6.2 (a): B.C. Women, Age 50 to 74, by Ethnic Representation
Figure 6.2 (b): B.C. Women, Age 50 to 74, who participated in the Screening Mammography Program by Ethnic Representation, 2000-2001 (inclusive).



Note: Asians include Chinese, Japanese, Korean, Filipino, Thai, Vietnamese, Indonesian, Malay, Mongolian, Tibetan, Punjabi, Singhalese, Tamil, Bangladeshi, East Indian, Pakistani and Sri Lankan.
(a)Source:Statistics Canada. 1996 Census.
(b)Source: BC Cancer Agency. *2001/02 Annual Report, Screening Mammography Program.*

The program also tries to reach women of other ethnic groups. Of B.C.'s female population (age 50 to 74), 12 per cent are Aboriginal, East/South East Asians, or South Asians. Collectively, their participation share (20 per cent) is larger than their share of the population (see Figure 6.2).

Pap Smears

B.C. was the first jurisdiction in the world to institute a screening program for cervical cancer using Pap smears, and in the past four decades cervical cancer rates in B.C. have fallen by 85 per cent.

According to the Canadian Task Force on Preventive Health Care (2002), Pap tests are recommended annually for women following initiation of sexual activity or at age 18. After 2 normal smears, women in stable, long-term relationships can be screened every 2 to 3 years to age 69. More frequent screening may be recommended for women with certain risk factors, such as HIV infection, infection with the human papilloma virus or an abnormal previous smear.

Participation rates for cervical screening have not changed much in the last few years. About six in ten B.C. women, age 20 to 69 years had a Pap smear in the last thirty months. By regions, participation rates tend to be higher in urban areas (B.C. Cancer Agency, 2002) (see Figure 6.3). When the rates are adjusted to exclude those women who have had total hysterectomies or those women who do not need regularly screening, it is estimated that 75 per cent of recommended women are accessing screening.

As we noted in 1999, some women, particularly Aboriginal women, recent immigrants and women from low-income households, have lower than average participation rates. We must do more to encourage those under represented groups to access this free and life saving service. The B.C. Cervical Cancer Screening program notes that 50 per cent of women who are found to have invasive squamous carcinomas of the cervix had not had a Pap test in the previous seven years (B.C. Cancer Agency, 2002).

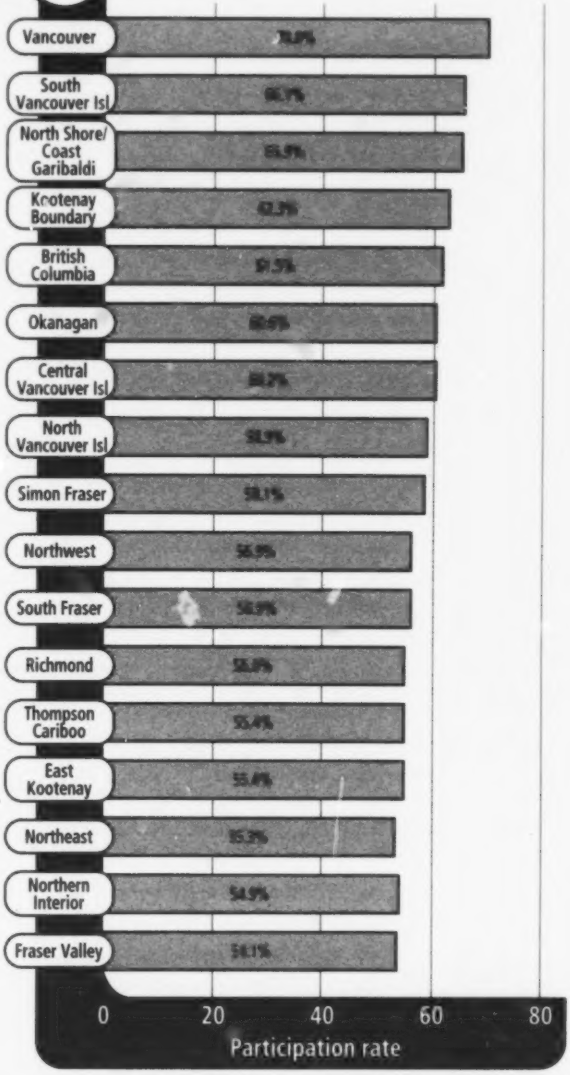
Smoking Cessation Services

Tobacco use ranks among the leading preventable cause of illness and death, so the potential benefits of smoking cessation are substantial. It is never too late to gain the benefits: even among long-term smokers over the age of 65, stopping smoking reduces the risk of tobacco-related diseases, slows the progression of established tobacco-related illness and increases life expectancy (U.S. Surgeon General, 1990).

However, smoking cessation is not easy. Nicotine addiction has strong physiological and psychological components and many who try to quit on their own fail. Since the majority of the population in this province visits a doctor yearly, the family doctor is in an ideal position to reach smokers and assess their readiness to quit. He or she can provide clear advice, counseling, stop-smoking medication, and long-term follow-up – all proven components of effective clinical tobacco intervention (Rigotti, 2002).

FIGURE 6.3

Pap smear participation rates, Women, Age 20 to 69 years, B.C. Health Service Delivery Areas, July 1999 to December 2001



Source: British Columbia Cancer Agency. *2002 Annual Report, Cervical Cancer Screening Program.*

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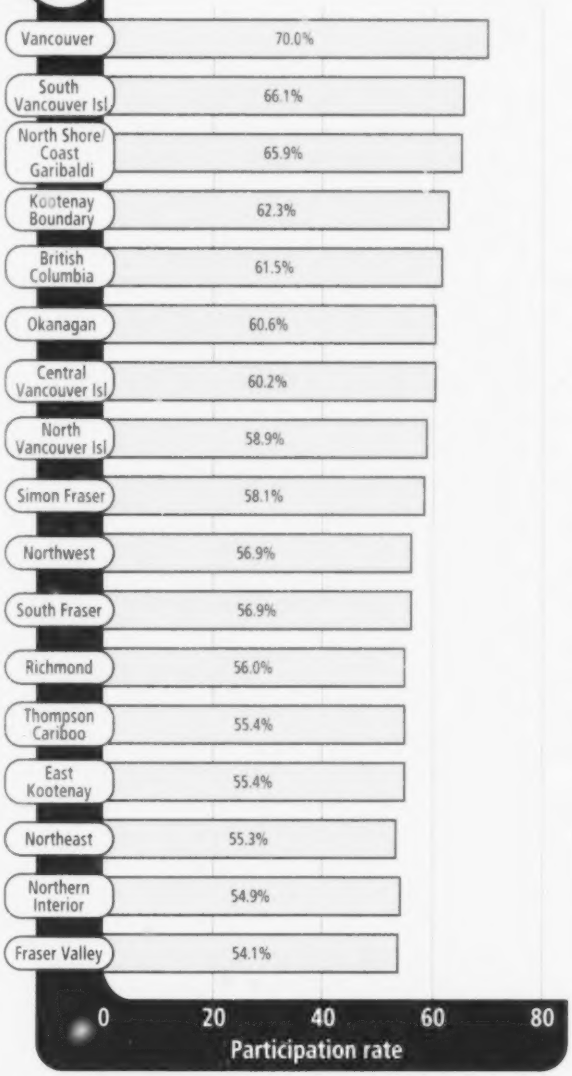


Source: British Columbia Cancer Agency. *2002 Annual Report. Cervical Cancer Screening Program.*

GENITAL WARTS AND CERVICAL CANCER

Over the last decade, scientists have discovered that five types of human papilloma virus (HPVs) are responsible for the majority of cervical cancers. Two types in particular, HPV-16 and HPV-18, are the most virulent, with HPV-16 estimated to cause a full 50 per cent of cervical cancers (Crum, 2002).

These viruses, which cause genital warts, are sexually transmitted. Cancerous cell changes can proceed extremely rapidly from infection, which explains why up to 50 per cent of cervical cancers occur in women who are being regularly screened.

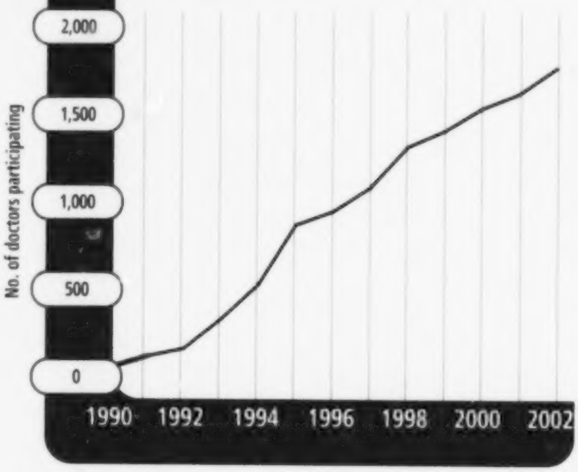
A new test for HPV is available. However, questions remain about how to use the test and to whom it should be offered. B.C.'s screening program is working with experts to develop guidelines.

Recent research has also focused on developing a vaccine against HPV strains. A recent preliminary controlled trial of a new HPV-16 vaccine found that there was no transmission of the virus in any of the subjects getting the vaccine. In the limited time frame of the study, none of the 768 women who received the vaccine developed cervical cancer cell changes, nor did any have HPV-16 residing in the genital tract where it could infect new sexual partners (Koutsky et al., 2002, Crum, 2002).

Although the results are very preliminary and the length of protection is not known, research on expanding the vaccine to protect against more strains of HPV continues. While experts predict Pap smears will still be needed to screen women in conjunction with the vaccine, over the next decade, we may see the wide-spread adoption of HPV vaccines to help further reduce the toll of cervical cancer.

Since 1990, the B.C. Doctors' Stop-Smoking Program has been tracking the clinical tobacco intervention activities of B.C. doctors. The program has been created by the Society for Clinical Preventive Health Care, which is dedicated to maximizing the preventive potential of the health care system. The program supplies physicians and other health professionals with clinical training and materials, and serves as a source of expert information on tobacco cessation interventions. Physician participation has steadily increased to 44 per cent in 2002. Figure 6.4 shows the number of doctors participating each year since 1990.

FIGURE 6.4 **Number of doctors participating in the B.C. Doctors' Stop-Smoking Program, B.C., 1990 to 2002**



Source: B.C. Doctors' Stop-Smoking Program.

As we have seen in Goal 2, fewer British Columbians than ever are smoking. Yet, as the prevalence of cigarette smoking falls, those left smoking are more severely addicted and more likely to have associated conditions (depression, schizophrenia, panic disorder, alcoholism). Prescription medication (such as the nicotine patch, nicotine gum or Zyban) plus counseling through family doctors has been proven as an effective method (Rigotti, 2002). According to the B.C. Doctors' Stop-Smoking Program, patient satisfaction is high and the majority of ex-smokers rate the program's effectiveness as high.

Other B.C. programs that reach out to help smokers include the B.C. Smoker's Helpline operated by the Canadian Cancer Society. The line is available toll free at 1-877-455-2233. Four trained tobacco cessation specialists can provide information, advice, and support. The specialists will help smokers plan and prepare to quit, help with the psychological challenge of withdrawal or choose a scientifically proven method of quitting that will work for the smoker. They will also refer smokers to local support programs in their community or mail them informational material. Between April 1, 2002 to March 31 to 2003, the line received 3,042 calls, up 42 per cent from the previous year when it first began. The busiest time is the first three months of the year (S. Craigie, personal communication, June 24, 2003).

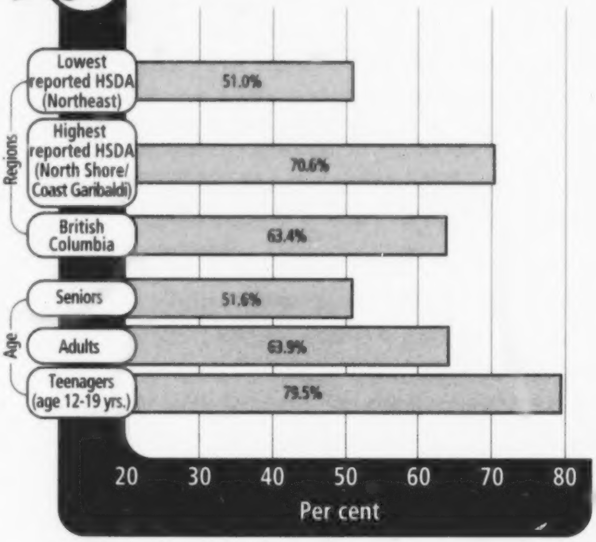
A high-school based program designed to help teenagers quit was introduced in 2000 by the B.C. Ministry of Health Planning. Called *Kick the Nic*, the program emphasizes peer support and skill-building activities developed by teens for teens. Teens in the program complete ten sessions on such topics as dealing with tobacco cravings, reasons for using tobacco and quit-day planning.

Dental Visits In Past Year

Oral health is an important part of general health. Having good oral health means you can eat, speak and socialize without active disease, discomfort or embarrassment. In addition, a number of recent studies have found an association between poor oral health – particularly periodontal disease – and an increased risk of cardiovascular disease and stroke. The association is still controversial, but even if the link is non-causal, it still demonstrates that coronary heart disease and periodontal disease tend to cluster in the same sections of the population, which is important from a public health perspective (Genco, et al., 2002, Morrison et al., 1999).

FIGURE 6.5

Visited dental professionals in the past year, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using CANSIM II (2002 October). http://www.statcan.ca/english/freepub/82-221-XIE/00502/community/system2.htm

About six out of every ten British Columbians age 12 and older visited a dentist in the past year, according to the Canadian Community Health Survey 2000/01 (see Figure 6.5). This is about the same as last reported in 1996/97. Visits to a dental professional vary regionally, with the highest per cent reported in North Shore/Coast Garibladi (70.6 per cent) HSDA and the lowest in the Northeast (51.0 per cent).

As we noted in the 1999 Annual Report, dental visits are largely determined by the ability to pay for services (Millar & Locker, 1999). Low rates of dental visits were most likely among working persons with low income. In a positive development, the Association of Dental Surgeons of B.C. held the first-ever province-wide dental outreach program called Community Dental Day on April 29, 2003. As part of oral health month, volunteer dentists in 40 communities around the province provided free dental treatment to some 750 low-income working adults. It is hoped that this will become a tradition, yet we must recognize that more programs, such as affordable insurance schemes, are needed to help pay for dental care.

Although dental needs change at different stages of life, visits to dental professionals should not decrease with age. However, older people tend to visit their dentists less often. Among seniors, only one in two visited a dental professional in the past year. Persons in age group 12 to 19 tended to have high yearly contact with dental professionals (79.5 per cent). For adults, age 20 to 65 years, 63.9 per cent visited their dentists in the past year.

Unmet Health Care Needs

Over the last few years, more British Columbians appear to be feeling that their health care needs are unmet. In 2000/01, 12 per cent stated that they had at least one unmet health care need during the past year. This is a three-fold increase from 1994/95, when only four per cent reported unmet needs. Several factors may explain the increase in reported unmet needs. These may be related to the structures and processes within the health care system, or to characteristics of the population, including individuals' perceptions of the state of health care (Statistics Canada, *The Daily*, March 13, 2002).

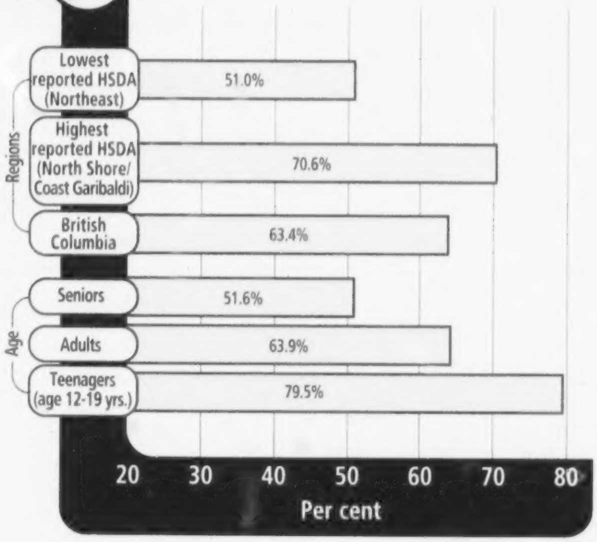
material. Between April 1, 2002 to March 31 to 2003, the line received 3,042 calls, up 42 per cent from the previous year when it first began. The busiest time is the first three months of the year (S. Craigie, personal communication, June 24, 2003).

A high-school based program designed to help teenagers quit was introduced in 2000 by the B.C. Ministry of Health Planning. Called *Kick the Nic*, the program emphasizes peer support and skill-building activities developed by teens for teens. Teens in the program complete ten sessions on such topics as dealing with tobacco cravings, reasons for using tobacco and quit-day planning.

Dental Visits In Past Year

Oral health is an important part of general health. Having good oral health means you can eat, speak and socialize without active disease, discomfort or embarrassment. In addition, a number of recent studies have found an association between poor oral health – particularly periodontal disease – and an increased risk of cardiovascular disease and stroke. The association is still controversial, but even if the link is non-causal, it still demonstrates that coronary heart disease and periodontal disease tend to cluster in the same sections of the population, which is important from a public health perspective (Genco, et al., 2002, Morrison et al., 1999).

FIGURE 6.5 Visited dental professionals in the past year, B.C., 2000/01



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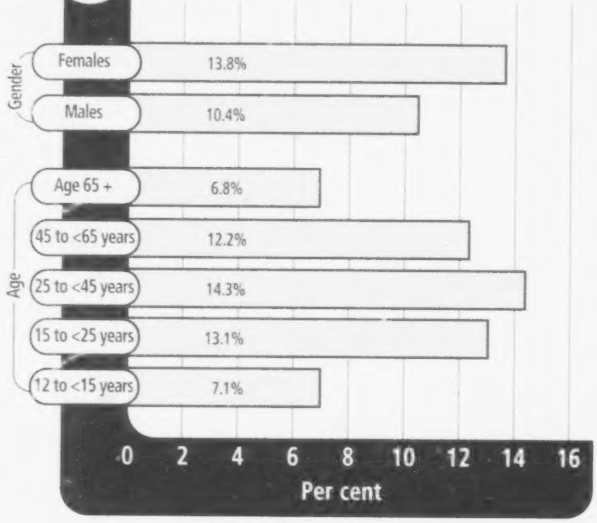
More females (13.8 per cent) than males (10.4 per cent) reported unmet health care needs. By age groups, more adults between the ages of 15 to 65 (about 13 per cent overall) reported unmet health care needs than those younger (7.1 per cent) or older (6.8 per cent) (see Figure 6.6).

Long waits and unavailability of services (including desired services that are not insured benefits in B.C.) were the most common reasons cited for unmet health care needs (Statistics Canada, *The Daily*, March 13, 2002). Personal circumstances such as being too busy, deciding not to bother, perceiving care would be inadequate, or disliking doctors are less likely to be reported as reasons for unmet health care needs.

As we note in the final pages of this chapter in "Focusing on Seniors and Health Services", need for health services and use of these services increase with age. However, seniors report the lowest rate of unmet health needs at just 6.8 per cent. This result could illustrate the effect of triage on access to health services; younger British Columbians, with potentially less severe health problems than seniors, may be having to wait while seniors needs are served first. This is an appropriate way to prioritize access to services but we must guard against rationing services so tightly that health access is impacted.

FIGURE 6.6

Per cent who reported unmet health care needs, B.C., 2000/01



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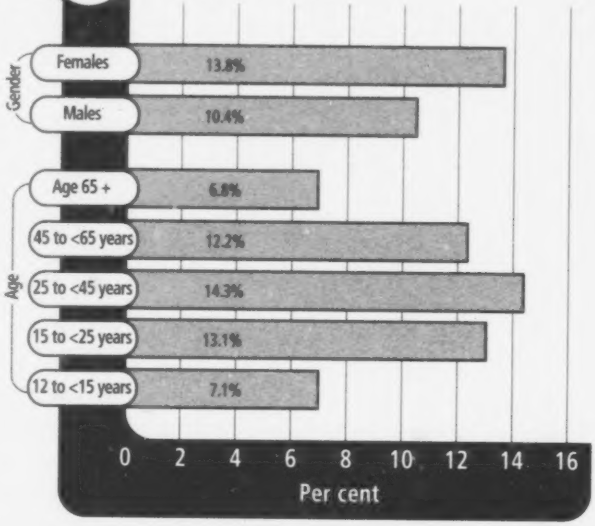


Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

Where Do We Go From Here?

While this section has shown that access to effective programs is available throughout B.C., not all British Columbians are able to use these services to their full advantage. Barriers to accessing available programs should be examined and overcome where possible, whether barriers are due to a lack of knowledge, inadequate outreach or, in the case of dental care, insufficient funds.

British Columbia has adopted the national target of 97 per cent of children immunized against diphtheria, polio, tetanus, *Haemophilus influenzae* type b (Hib), measles, mumps and rubella, and pertussis at 95 per cent by their second birthday. As rates have remained unchanged, between 81 to 85 per cent in the last few years, we are still far from reaching the target. However, the proposed National Immunization Strategy will assist nation-wide coordinated efforts to ensure equitable access to all vaccines. Recent additions in B.C. to the childhood immunization schedule are the pneumococcal and meningococcal vaccines. The B.C. Ministry of Health Planning is reviewing a recommendation to add varicella vaccine to the schedule.

Although the provincial influenza immunization target for seniors in the community, established at 80 per cent, has not been met, the actual rates are progressing in the right direction. This is particularly so for residents in care facilities, where rates are only slightly short of the target of 90 per cent. More effort needs to be put into vaccination education for health care workers.

For a screening mammography program to have optimal effect in reducing breast cancer death rates, 70 per cent of women, age 50 to 74, have to be regularly screened every two years. In British Columbia, the target is yet to be reached. Only 49 per cent of women age 50 to 74 have participated in the program.

The goal of the cervical cancer screening program is to have all sexually active women in the target age group receive regular Pap smears. Again, participation rates of 61.5 per cent of all women (75 per cent when adjusted for those who probably do not need screening) have remained relatively unchanged compared to previous years. Performance, therefore, is falling short of expectation. Recent advances in the understanding of the role of HPV infection, testing for HPV and the development of an HPV vaccine may improve cervical cancer prevention.

There are no provincial targets for dental visits but we can look to the group with highest visit rate as targets. In 1996/97, eight out of every ten British Columbians with high incomes visited a dentist in the past year – possibly a suitable target for all of B.C. As frequency in dental visits is evidently linked to ability to pay, some groups need more help.

A program initiated by the medical profession and based in best practice evidence is the B.C. Doctors' Stop-Smoking Program. Each year, more than 120 doctors are new participants to this program that helps smokers quit their habit. The long-term goal of the program is to enroll all physicians in this brief intervention-based program. Research evidence is showing that prescription medication in conjunction with counseling and support is the most effective method to stop smoking.

Recent increases in the proportion of the population citing unmet health care needs, long waiting lists and unavailability of services may be signs that accessibility is becoming a problem.

What Actions Can We Take?

Individuals and families:

- Know which vaccines you and your family members should be getting.
- Make sure all family members have an immunization record and that immunizations are up-to-date.
- Know and take the preventive and screening exams for your age, gender and risk factors.
- If you are a smoker, seek out the available programs and resources to help you quit.

Governments and Regional Health Authorities:

- Strengthen immunization programs and advocate with Health Canada for full funding of the National Immunization Strategy.
- Encourage appropriate groups to access the provincial breast and cervical cancer screening programs throughout the province by educating them on the benefits of early screening. In particular, target low income and Aboriginal women.
- Improve access to dental health education and regular dental care, through universal access programs or through specific support to groups without insurance.
- Expand availability of smoking cessation services.

Doing the Right Things Right

British Columbians need to be assured that the care they receive is the right care. As we noted in the opening of this chapter, more health care is not necessarily better health care. More care can mean more doctors' visits, more treatment and more hospitalizations, but it may not mean better health, longer life or improved outcomes. Too much care, or inappropriate care, can lead to patient harm or even death. Inappropriate care not only harms patients, it wastes precious public resources that could be used more effectively to improve the health of more British Columbians. We can contrast this with the previous finding that a higher proportion of people in B.C. feel that their health care needs are unmet and conclude that defining health care needs and meeting health care demands is a very complicated process.

The concept of "Doing The Right Things Right" has three fundamental aspects:

- **Effectiveness:** the treatment or care must be proven to work and must be the medical option that poses the least risk with the best possible outcome. That means that treatments that have scientifically been shown to improve outcomes or prevent adverse events should be readily available to those who can benefit them; unproven treatments should be subjected to evaluation and those shown to cause disproportionate harm should cease.
- **Appropriateness:** the intensity, type and timing of care must be in line with the needs and best interests of the patient. Elderly patients, for example, should not wait in hospital beds when what they really need is support in the community or placement in care facilities. Birthing women should not be given caesarean sections if they can safely deliver their babies naturally with proper care and support.
- **Safety:** all medical care has its risks and benefits. The health care system must be vigilant about reducing the inherent risks of medical care as much as possible and ensuring that human or systems error are not introduced. Medical error, improper prescribing, and inappropriate treatments or procedures must be prevented. A culture of safety and quality improvement must be built into the systems of health care.

TYPES OF MEDICAL ERRORS

- **Diagnostic**
  - Error or delay in diagnosis
  - Failure to use indicated tests
  - Using outmoded tests
  - Error in the performance of a test
  - Failure to act on results of a test
- **Treatment**
  - Error in the performance of a treatment or procedure
  - Error in the dose of method of using a drug
  - Failure to administer an indicated treatment
  - Inappropriate (not indicated) treatment
- **Prevention**
  - Failure to provide prophylactic treatment
  - Inadequate follow-up
- **Other**
  - Failure of communication
  - Equipment failure
  - Other system failure

(Source: Leape, L., Lawthers, A.G., Brennan, T.A. & et al., Preventing Medical Injury. *Qual Rev Bull.* 19(5): 144-149, 1993).

Focus On Building A Safer System

The safety of health care has been receiving increasing attention over the last five years. Although medical error has long been known to exist, the full extent of the problem was not recognized nor publicized until the release in late 1999 of a landmark comprehensive report by the U.S. Institute of Medicine (Kohn et al., 2000). Called *To Err is Human,* this report compiled existing case studies and estimated that between 44,000 and 98,000 deaths each year in the United States result from medical errors. It estimated that more people die from medical mistakes in the U.S. each year than highway accidents, breast cancer or AIDS. The report confirmed earlier studies from Australia that found 16 per cent of all hospital admissions were associated with an adverse event, of which about half were preventable (Wilson et al., 1995).

The U.S. report did not blame individual health professionals as being the major source of the problem. Instead, it stressed that faulty systems, processes, and conditions lead people to make mistakes or fail to prevent them. It claimed the health industry was decades behind other high-risk industries, such as aviation, in setting up standards, establishing mandatory reporting requirements, and using other tools and systems to prevent errors from arising and to learn from the ones that do arise.

Two Initiatives Examine Medical Error In Canada

In the absence of definitive studies on medical error in Canada, most experts have taken the U.S. Institute of Medicine upper estimate of 98,000 and divided by 10 to get an approximate estimate of 10,000 for the annual toll of medical mistakes in Canada (McIver, 2002). Recently, two major Canadian medical bodies have begun to look at health care safety in a Canadian context.

In September 2001, the Royal College of Physicians and Surgeons created the National Steering Committee on Patient Safety, which released a report in September 2002. The report *Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Health Care* outlines 19 recommendations, including the creation of an independent Patient Safety Institute that would track the prevalence of medical mistakes, help build safeguards into the system, and educate health professionals.

A joint project established in 2002 by the Canadian Institute of Health Information (CIHI) and the Canadian Institutes of Health Research (CIHR) is conducting the first prevalence study of medical error and adverse events in Canadian hospitals. Using methodology similar to studies in the U.S. and Australia, researchers under the project are conducting a systematic review of hospital charts at a selection of hospitals in B.C., Alberta, Ontario, Quebec and Nova Scotia. The researchers will be looking at randomly selected charts to see whether there was an adverse event, such as an unintended injury or complication which resulted in disability, death or prolonged hospital stay, that was the result of hospital or medical management rather than the patient's disease. The results of this study will be available in late 2003 or early 2004. For more information on the study, see the Adverse Events Study on the CIHI Web site www.cihi.ca

This research will help shed important light on the extent of adverse events in Canada and begin to put the systems in place to reduce their toll.

Under "Doing The Right Things Right" we examine the following B.C. indicators: use of self-care, use of protocols and guidelines, antibiotic prescribing, breast conserving surgery, caesarean deliveries, preventable admissions and hospitalizations, alternative level of care days, and community follow-up for mental health.

What Do The Indicators Show?

- British Columbians are receiving alternative supports to manage time-limited or non-threatening symptoms themselves through a province-wide nurse line, the B.C. HealthGuide and availability of B.C. Healthfiles and other quality health information on line. These services appear to be improving the appropriate use of health services.
- An increasing number of clinical protocols have become available, which outline consensus evidence on how certain symptoms, illnesses and diagnostic procedures should be investigated and treated. These guidelines not only standardize and improve patient care, but are estimated to have saved $35 million since their inception in 1996/97.
- Antibiotic prescribing for childhood ear infection (otitis media) appears to have remained relatively unchanged and is likely in excess of what is ideal.
- The proportion of women with breast cancer receiving lumpectomy rather than mastectomy has remained unchanged since the 1999 Annual Report, with six out of 10 receiving breast-conserving surgery.
- B.C.'s rate of caesarean sections continues to climb with 27.9 per cent of birthing women undergoing the operation in 2002, up from 22.2 per cent in 1999. The World Health Organization, as well as the B.C. Reproductive Care Committee, suggests that caesarean section rates of over 15 per cent indicate that some women are getting unnecessary operations that expose them to a greater risk of harm and complications as well as prolonged recovery.
- Preventable admissions to hospitals are declining. Fewer health problems that could be treated in the community, such as diabetes, asthma, depression and alcohol abuse for example, are being treated in hospital. The B.C. rate while falling is still above the Canadian average.
- Unnecessary admissions to hospital for minor or time-limited complaints are also declining, down from 9.6 cases per 1,000 in 1996/97 to 6.9 cases per 1,000 in 2000/01.

- Lengths of hospital stays are declining very slightly but they generally indicate that most patients do not stay in hospital longer than required.
- In 2001/02, 14.8 per cent of total inpatient days are alternate level of care (ALC) days. More elderly patients, however, are spending time waiting in hospital beds for alternative levels of care (such as home care or community care) to become available.
- The majority of mental health patients receive follow-up care from a physician or mental health worker after hospitalization. However, that rate over five years remained around 70 per cent and is still below recommended targets. Initiatives are underway across all the health authorities to improve reporting of community health data.

Opportunities For Self-Care

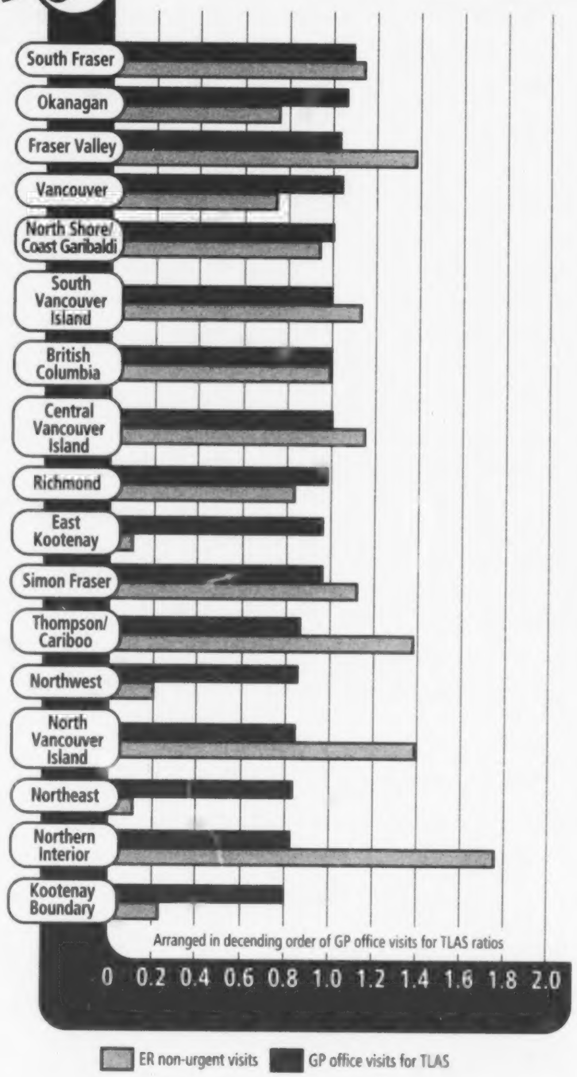
Not all health concerns need to be seen by a doctor or health care professional. In fact, many common health complaints can be safely and effectively managed by patients or families themselves – with better results, less discomfort and better use of resources. In particular, time-limited acute symptoms (TLAS), such as colds, influenza, backaches, headaches and skin rashes, are appropriate for self-care. TLAS make up about one-quarter of all general practitioner visits. Many non-urgent emergency room visits are also potentially treatable at home or in less intensive health care settings.

B.C. residents are getting better at looking after minor health complaints. In 2001/02, there were 1,268 TLAS visits per 1,000 population (age standardized), a drop from 1,370 visits per 1,000 population in 1997/98. For non-urgent emergency room visits, the rate per 1,000 population (age standardized) also dropped from 83.9 to 59.3, in the same period.

The improvements could be a result of new initiatives aimed at British Columbians to help them have the information and confidence to know when a medical complaint or symptom can be safely treated at home and when it warrants the attention of a medical professional. In April of 2001, the B.C. HealthGuide Program was extended to the entire province following a pilot project carried out in the Greater Victoria area. This program provides a 400-page book to every household in the province detailing the symptom management and recommended actions to deal with more than 100 common health complaints. In addition, a province-wide toll free nurse line (1-866-215-4700) lets British Columbians talk with a nurse 24/7 and obtain information, advice

FIGURE 6.7

GP visits For Time Limited Acute Symptoms (TLAS) and Emergency Room (ER) Visit Ratios, B.C. Health Service Delivery Areas, 2001/02



Note: Ratios are derived dividing GP office visits for TLAS and ER non-urgent visits (age standardized) for the respective HSDA by the provincial average. The higher the ratio, the fewer self-help opportunities were exercised, compared to the provincial average.
Source: Health Information Access Center, B.C. Ministry of Health Services. Prepared using claims data from the Medical Services Plan.

and referrals to appropriate health resources. Finally, a highly detailed computer database of reliable health information is now available at www.bchealthguide.org – the B.C. Ministry of Health Planning sponsored Web site. By entering a B.C. postal code, the user can access a wide range of health information and also find support groups and health agencies in British Columbia.

Preliminary data suggests the B.C. Nurseline is effective. Reports show that by talking with a nurse, many people avoided using unnecessary health services. The program also aims to increase appropriate care, for example, ensuring people with abdominal pain localized to the right seek medical care to rule out appendicitis or those with a changing mole are evaluated for potential skin cancer. The nurse line also encourages individuals to seek medical help and in half the cases confirmed or reassured individuals that their intended actions were correct. These are all signs that patients are being better supported and educated to take an active role in managing their own health problems.

The existence of walk-in clinics is also redirecting patients with more minor symptoms or non-emergent complaints away from emergency departments – although this does not mean those complaints necessarily need to be seen or that the care is a necessary use of resources. However, they do meet a public demand. A recent study of walk-in clinics in Ontario suggests that their patients were generally more satisfied with the service received, especially with waiting times, than emergency room patients (Hutchison et al., 2003).

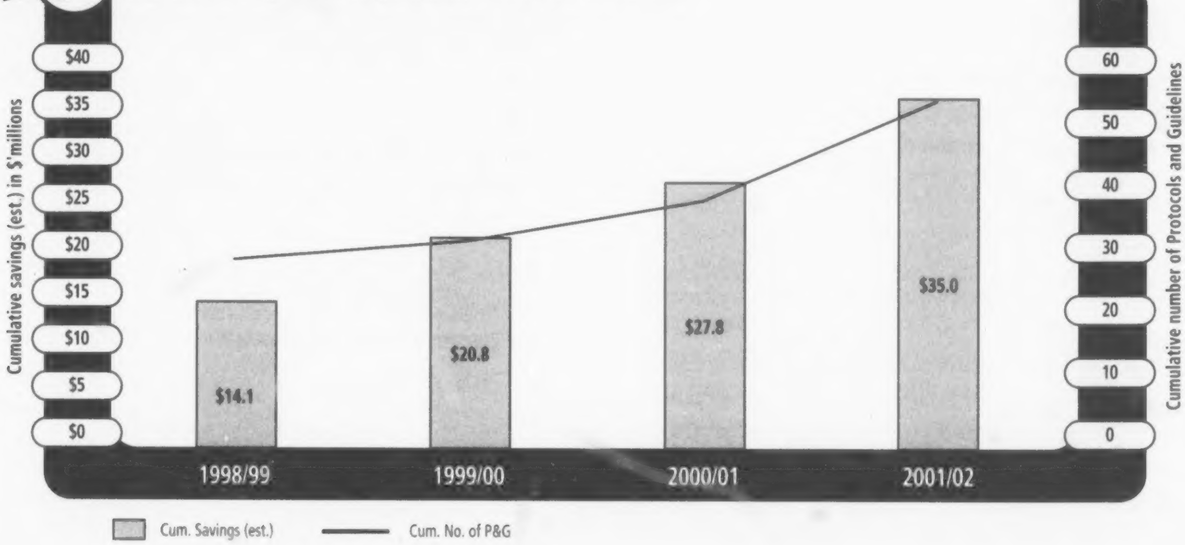
Figure 6.7 shows the ratios of each TLAS and ER non-urgent visits by region against the provincial average. Higher ratios mean fewer self-help opportunities were exercised, compared to the provincial average. It is noticeable that people in the north and the interior parts of the province rely more on the emergency room for non-urgent care. This may be because the emergency room is a convenient place for after-hours care. It could also reflect the lack of access to primary care in these regions.

Use Of Protocols And Guidelines

Protocols and guidelines are information tools to ensure that physicians have the latest evidence-based data to guide their daily decisions when caring for their patients. Evidence-based guidelines have been shown to promote consistency in access and clinical outcomes. Since 1996, the Guidelines and Protocols Advisory Committee (GPAC), jointly sponsored by B.C. Medical Services Plan and the B.C. Medical Association, has been creating protocols for a wide range of health conditions and symptoms. Examples include when to X-ray an ankle injury, when to prescribe an antibiotic for a sore throat,

FIGURE 6.8

Cumulative savings (estimated) and number of recommended protocols and guidelines (P&G), B.C., 1998/99 to 2001/02



Source: Medical and Pharmaceutical Services, B.C. Ministry of Health Services.

or how often to conduct blood, urine and other tests for patients with diabetes.

Medical services that are typically supported and recommended for protocols and guidelines are those that are:

- high in volume or cost;
- provided differently by different physicians and/or;
- present opportunities for improvement in practice.

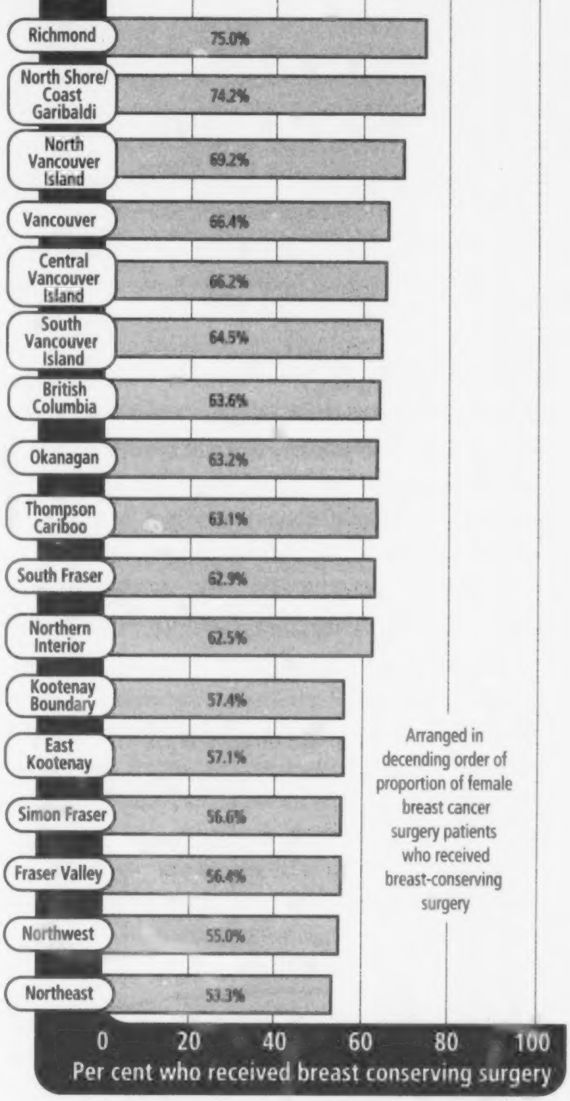
There are 52 guidelines disseminated so far by the GPAC with more under development. Along with standardizing and improving the quality of patient care, these guidelines are estimated to have saved $35 million since inception (see Figure 6.8). More information on new chronic disease guidelines and previously recommended protocols and guidelines are available from: http://www.healthservices.gov.bc.ca/msp/protoguides/index.html

Breast-Conserving Surgery

Since the mid-1980s, evidence has shown that most women with breast cancer fare equally well by having only the breast lump rather than the entire breast removed followed by chemotherapy and/or radiation. Lumpectomy, or breast-conserving treatment, is now considered a viable alternative to mastectomy and represents a less-invasive treatment option.

FIGURE 6.9

Breast-conserving surgery, B.C. Health Service Delivery Areas, Annual average for 1997/98 to 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

The number of women with breast cancer choosing this treatment method, either on their own or on the advice of their doctor, has remained unchanged over the last five years. In British Columbia, a consistent six out of ten breast cancer patients received breast conserving surgery instead of mastectomy.

ICD9 VERSUS ICD10 CODING

Since 1893, the causes of death and disease have been subject to an international classification system, which is now coordinated by the World Health Organization.

The International Classification of Diseases (ICD) promotes international comparability in medical research, outcomes and analysis. For almost two decades the ninth revision (ICD9) has been used, but in the mid-1990s, the WHO published the 10th revision. By 2000/01 most countries had moved to the ICD10 coding.

In this report 2001/02 data for (a) breast-conserving surgery, (b) preventable admissions to hospitals and (c) expected compared to actual stay are based on ICD10 coding. Data for previous years were based on ICD9 coding. In preparation of the trend data, all the necessary steps were taken to ensure consistency and minimize differences where exact mapping is not possible.

and referrals to appropriate health resources. Finally, a highly detailed computer database of reliable health information is now available at www.bchealthguide.org – the B.C. Ministry of Health Planning sponsored Web site. By entering a B.C. postal code, the user can access a wide range of health information and also find support groups and health agencies in British Columbia.

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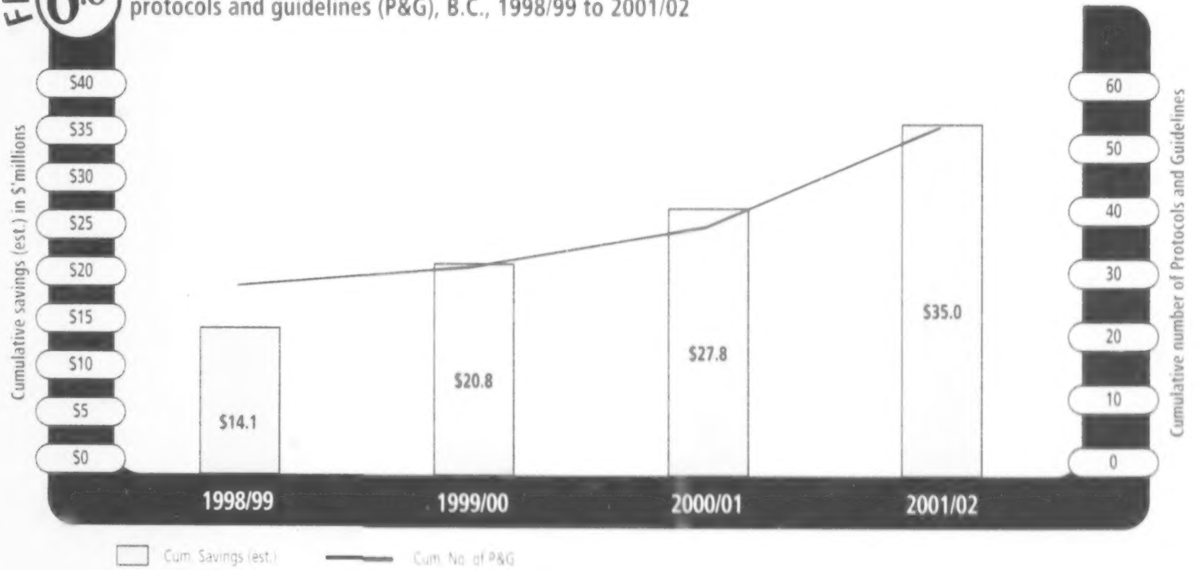

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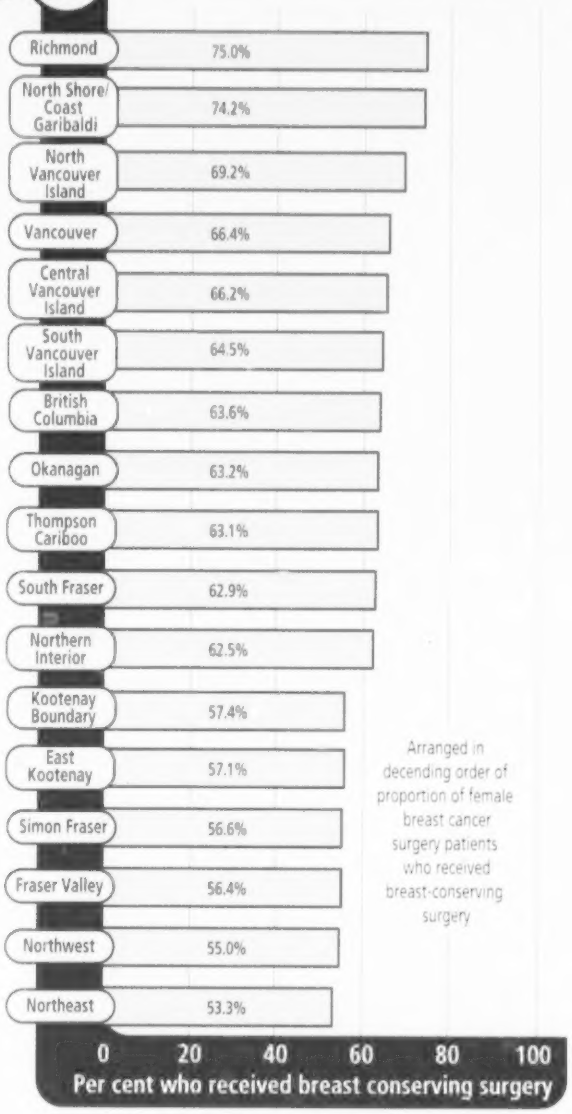
Since the mid-1980s, evidence has shown that most women with breast cancer fare equally well by having only the breast lump rather than the entire breast removed followed by chemotherapy and/or radiation. Lumpectomy, or breast-conserving treatment, is now considered a viable alternative to mastectomy and represents a less-invasive treatment option.

FIGURE 6.9 **Breast-conserving surgery, B.C. Health Service Delivery Areas, Annual average for 1997/98 to 2001/02**



Arranged in decending order of proportion of female breast cancer surgery patients who received breast-conserving surgery

Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

The number of women with breast cancer choosing this treatment method, either on their own or on the advice of their doctor, has remained unchanged over the last five years. In British Columbia, a consistent six out of ten breast cancer patients received breast conserving surgery instead of mastectomy.

ICD9 VERSUS ICD10 CODING

Since 1893, the causes of death and disease have been subject to an international classification system, which is now coordinated by the World Health Organization.

The International Classification of Diseases (ICD) promotes international comparability in medical research, outcomes and analysis. For almost two decades the ninth revision (ICD9) has been used, but in the mid-1990s, the WHO published the 10th revision. By 2000/01 most countries had moved to the ICD10 coding.

In this report 2001/02 data for (a) breast-conserving surgery, (b) preventable admissions to hospitals and (c) expected compared to actual stay are based on ICD10 coding. Data for previous years were based on ICD9 coding. In preparation of the trend data, all the necessary steps were taken to ensure consistency and minimize differences where exact mapping is not possible.

Many reasons could explain the lack of change, including little knowledge of this treatment method, women's preferences, physicians' patterns of practice and/or access to radiation treatment. This treatment choice, however, is more common with women below 65 years of age, likely because it is a less body-altering choice.

Regional differences within the province also have not changed much over the years. This form of cancer treatment continues to be more common in Richmond and North Shore/Coast Garibaldi Health Service Delivery Areas (HSDA) and less common in the northern regions of British Columbia (see Figure 6.9). The variations in treatment should be examined, especially if it represents outdated treatment methods or lack of access to the required radiation therapy that should accompany lumpectomy.

Caesarean Deliveries

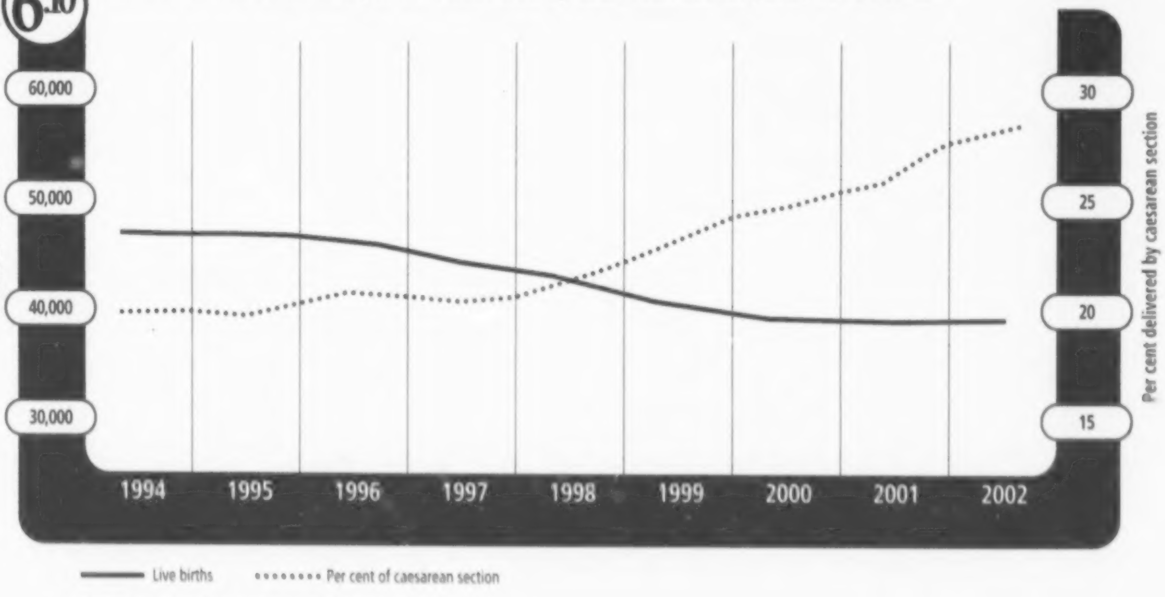
A caesarean section to deliver a baby, when necessary, can be a life-saving procedure for both the mother and infant. However, World Health Organization (WHO) evidence suggests many c-sections are not medically necessary and expose the birthing mother to the risks of major abdominal surgery including hemorrhage, infection, injury to other organs, complications of anesthetics, potential transfusions, scarring and prolonged recovery after birth. Infants born by c-section can sometimes have a higher incidence of breathing problems. Not only do unnecessary c-sections expose the mother and child to potentially more risks, they are almost twice as expensive as a vaginal birth.

A review by the WHO suggested caesarean delivery rates above 10 to 15 per cent present no clear benefits. B.C. is far from this goal, with slightly more than one in four (or 27.9 per cent) of all deliveries now delivered by caesarean sections. This is up from 22.2 per cent in the 1999 Annual Report and still represents one of the highest rates in Canada and the industrialized world.

While the number of live births in B.C. has been gradually dropping in the last decade, from 46,800 in 1994 to 39,900 in 2002, the number of c-sections has been rising (see Figure 6.10).

A reduction in the number of caesarean deliveries to 15 per cent (of all live births) would mean 4,500 to 5,000 fewer surgeries a year and a corresponding drop in the associated risks and costs. Reducing the number is not easy, however. Some of the factors associated with higher c-sections rates included the increased use of fetal monitors that may heighten anxiety in both delivering mothers and attending staff.

FIGURE 6.10 Number of live births and per cent delivered by caesarean section, B.C., 1994 to 2002



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

More women are having first births after age 35. Increased age can lead to greater rates of assisted reproduction, multiple births and more difficult labors - all which contribute to increased rates of c-sections. A culture of reproductive rights, in which many women believe the ability to request a c-section should be part of their range of reproductive choices, is also contributing to the rise. As the complication rates of c-sections drop and the procedure becomes safer, some obstetricians and others skilled in reproductive care believe that this option should be made available to women as a choice as it clearly reduces some of the more common complications of vaginal delivery, such as episiotomies, muscle tears, and damage to the pelvic floor.

B.C.'s Reproductive Care Program, whose mission is to optimize the maternal, fetal and infant health in B.C. has endorsed guidelines aimed at successful vaginal birth after a c-section. This is one area where c-section numbers could potentially decrease. Research has shown that between 50 and 80 per cent of women who had a c-section for their first child can safely have a vaginal delivery for the second child.

Antibiotic Prescribing

The development of antibiotics to combat the bacteria responsible for numerous infectious diseases has been one of the medical miracles of the last century. Over the last few decades, however, many antibiotics have lost their effectiveness, threatening to put us into a post-antibiotic age in which infectious disease is once again one of the more prevalent risks to public health. Overuse and inappropriate use of antibiotics have contributed to the emergence of resistant strains.

As we noted in both the 1999 Annual Report and in a special 2000 Report – *Antimicrobial Resistance: A Recommended Action Plan for British Columbia* (Provincial Health Officer, 2000 December), many people are receiving prescriptions for antibiotics that they do not need, which contributes to the emergence of resistant strains and is a waste of health care resources.

Tallying prescriptions given for children with ear infections is one method to monitor appropriate antibiotic prescribing as it is a very common illness and one for which antibiotics are frequently prescribed in North America. Research shows that the rate of prescribing varies widely by country. For example, antibiotics are rarely prescribed for childhood ear infection in Scandinavian countries. In addition, research shows that viruses, which do not respond to antibiotics, cause 30 per cent of ear infections and that 80 per cent of ear infections resolve on their own. When a prescription is given, sometimes doctors do not prescribe the recommended "first line" of antibiotics but use another, less appropriate antibiotic.

B.C. PROTOCOL FOR EARACHE

- **Children under age two who have acute otitis media (earache) should be treated with Amoxicillan or, if they are allergic to penicillin, Erythromycin or Sulfisoxazole. These three are considered "first line" treatment.**
- **Children over the age of 2 should be watched for at least 48 to 72 hours and managed with pain relief; 80 per cent will have symptoms resolve. Those who do not should be treated with the above antibiotics.**

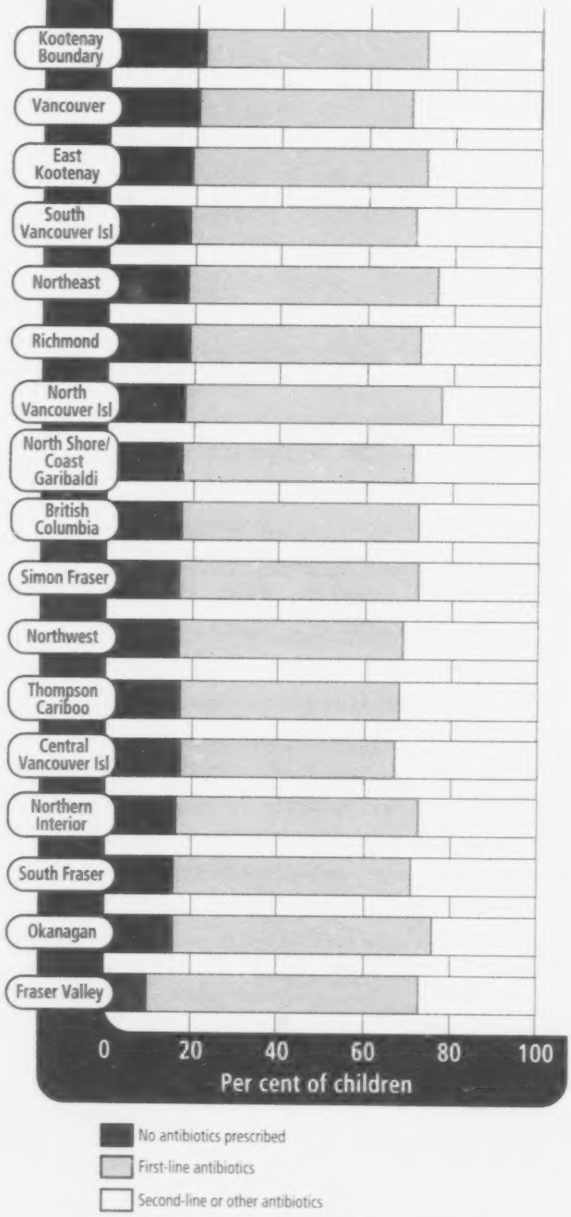
Guidelines and Protocols Advisory Committee, 2002 June.

However, tracking the number of B.C. children with ear infections each year who are prescribed antibiotics is not easy and this makes the indicator a difficult one to follow from year to year. The databases that store the information are very complex. They are also dynamic - frequently being refined or modified to meet new business requirements. As we gain more knowledge of these databases, we also gain new interpretation of previous data requirements. For this report we used a slightly changed methodology from that used for the 1999 Annual Report. We retrieved five years of data from 1997/98 to 2001/02 that covered some of the years already reported in 1999 Annual Report. By doing so, the process allowed us to check if the changed methodology enabled us to obtain similar results for years already evaluated in the 1999 Annual Report.

This new methodology provided similar but not identical results. Instead of 116,600 children (0 to 14) visiting the family doctor for ear infection in 1998/99, which we reported in the 1999 Annual Report, the new methodology tally came to 112,800 children (0 to 14) for the same year. Under the new methodology, by 2001/02, this number had dropped to 91,000. Unfortunately, it is impossible to determine how much this drop results from: a decline in the number of ear infections during the year or an increase in the number of parents who are appropriately monitoring their child's condition for at least 48 hours to subsequently see the earache resolve.

FIGURE 6.11

Antibiotic prescribing for children with ear infections, B.C. Health Service Delivery Areas, 2001/02



Source: Health Information Access, B.C. Ministry of Health Services. Prepared using these data sources - claims data from the Medical Services Plan and data on type of antibiotic prescribed from PharmaNet.

A 4.5 per cent decrease in the population, age 0 to 14 years (from 1998 to 2002) could also partially explain the drop.

Of those 91,000 who did see the doctor for an earache, the proportion of those who received first-line antibiotics remained about the same, at about 57 per cent for the period 1997/98 to 2001/02. In 2001/02, 28 per cent received second-line or other antibiotics. Only 15 per cent did not receive any antibiotics at all – very similar to previous years. Figure 6.11 illustrates these rates by HSDAs. Regional differences may be due to differences in practice patterns by doctors and/or differences in parental decisions for managing ear infections.

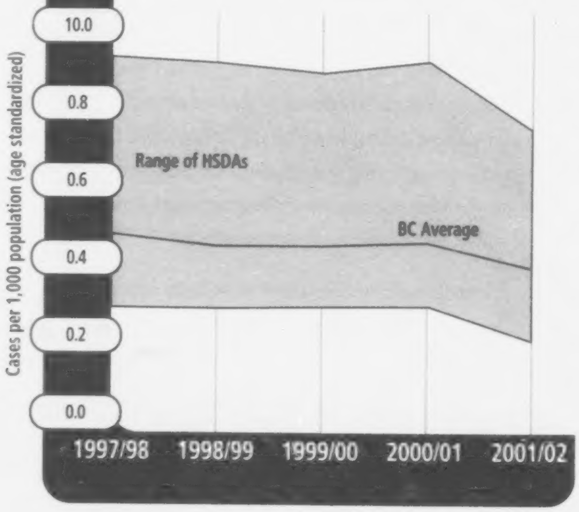
Preventable Admissions To Hospitals

There are a number of recognizable health problems that can usually be well managed in the community and need not require hospitalizations. They are called "ambulatory care sensitive conditions" and are related to diabetes, asthma, hypertension, neurosis, depression and abuse of alcohol or drugs.

Compared to 1997/98 (17,825), there is a drop of 22 per cent in the number of preventable hospital admissions in 2001/02 (13,948). The age standardized admission rate per 1,000 population also decreased from 4.5 to 3.4 during the five-year

FIGURE 6.12

Preventable admissions B.C., 1997/98 to 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

MANAGING CHRONIC DISEASE FOR BETTER OUTCOMES

When a chronic disease cannot be cured, good disease management by health professionals and patients themselves can prevent hospitalizations, serious complications or slow the course of the disease.

A prime example of "Doing the Right Things Right", chronic disease management (CDM) has four essential features:

- patient registries so doctors can track and recall their chronic disease patients for preventive tests and treatments;
- strict adherence to treatment protocols so patients are sure to get the most beneficial care;
- multidisciplinary teams so patients have easy access to a range of expertise including dieticians and therapists and;
- resources for patient education and self-management that give patients the tools and information they need to help better manage their disease.

B.C.'s health ministries are developing CDM programs to address nine major chronic diseases in B.C. – diabetes, congestive heart failure, asthma, depression, high blood pressure, chronic lung disease, renal failure, liver disease and arthritis. This initiative should greatly enhance the care for British Columbians with chronic disease.

period. All regions are also showing decrease over the past five years (see Figure 6.12).

A combination of factors may be affecting the decreased number and rates of admissions. Health care professionals in the community could be better managing patients with these conditions through timely diagnosis, treatment and education. As well, patients could also be taking steps to manage their disease. The increased focus on chronic disease management, which features patient registries, computerized records, adherence to evidence-based protocols and guidelines, and patient self management supports both doctors and patients.

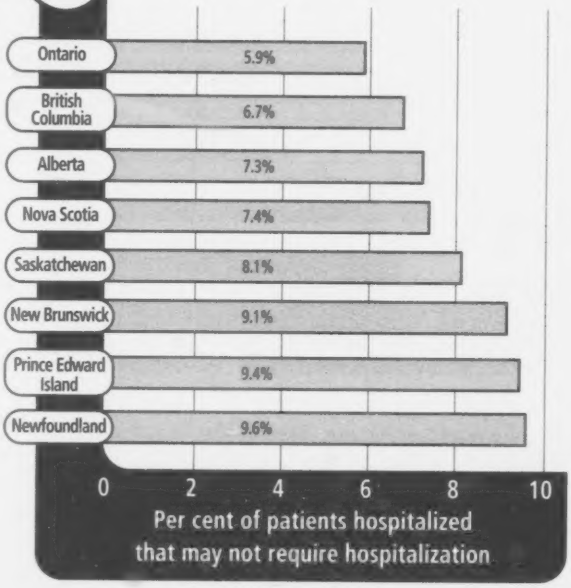
Nevertheless, there were still about 14,000 hospital admissions that could have been prevented in 2001/02. Rates in the Northern Health Authority have consistently been higher than the provincial average over the last five years. Higher admission rates could be due to problems in access or delivery of primary care, or to higher prevalence rates for these ambulatory care sensitive conditions (ACSC). As well, a recent CIHI report showed that B.C.'s rate (385 per 100,000) for age standardized inpatient acute care hospitalization for ACSC is still slightly higher than the Canadian average (370 per 100,000).

Better chronic disease management will also prevent admissions to hospital for diseases like diabetes, congestive heart failure, asthma and other conditions. (See box.)

May Not Require Hospitalization

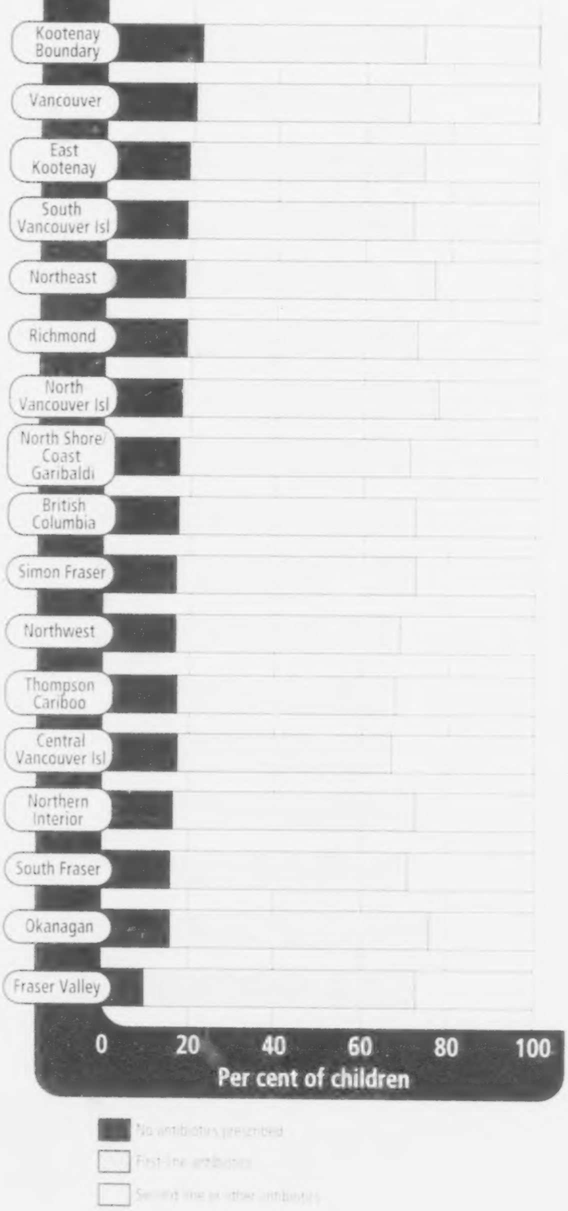
Patients who are admitted into an overnight hospital bed but whose medical condition may not be serious or may be more appropriately treated in another venue – such as day surgery - are classified as May Not Require Hospitalization (MNRH). Some examples include tooth extractions, circumcisions, hernia repair,

FIGURE 6.13 Per cent that may not require hospitalizations, Canada, 2002



Source: Canadian Institute for Health Information. (2003). Prepared using http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm

FIGURE 6.11 Antibiotic prescribing for children with ear infections, B.C. Health Service Delivery Areas, 2001/02



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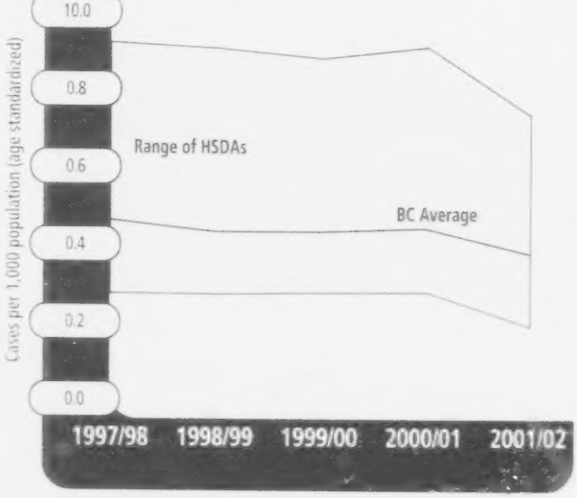

Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

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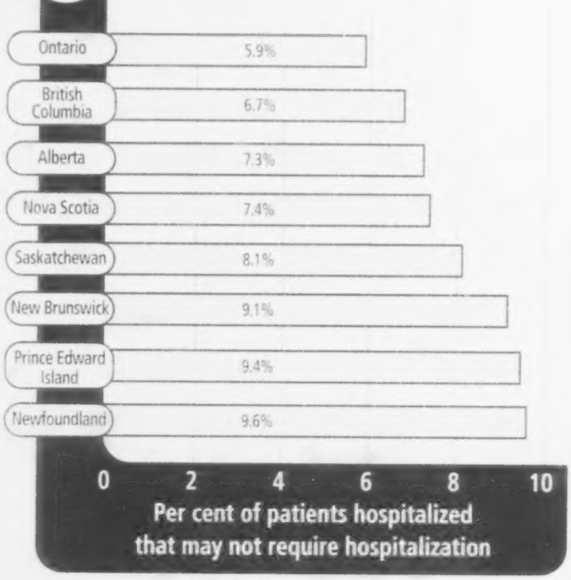


Source: Canadian Institute for Health Information. (2003). Prepared using http://www.statcan.ca/english/freepub/82-221-XIE/00502/tables.htm biopsies, and other small surgical procedures as well as time-limited conditions that can be observed at home or through a doctor's office.

Continued efforts to reduce unnecessary hospitalizations are showing positive results. In 1996/97, 9.6 cases per 1,000 population of MNRH (age standardized) were reported in British Columbia. This dropped to a rate of 6.9 cases per 1,000 population (age standardized) in 2000/01. All regions are also showing the same positive results with rates decreasing by almost 40 per cent in the North Shore/Coast Garibaldi and Northwest HDSAs.

The Canadian Institution for Health Information also collects cross-country data for an indicator that has a similar definition. Their data showed that British Columbia's proportion of hospitalizations that may not require hospitalization is lower than in all but one province, Ontario (see Figure 6.13).

Reducing unnecessary hospital stays is not merely a question of saving money and using resources more efficiently, it also reduces the chance of hospital-based adverse events occurring.

Expected Length Of Stay Compared To Actual

Just as no one should be admitted to hospital who could better be treated somewhere else, no one should stay in hospital any longer than necessary.

Expected length of stay in the hospital depends on the diagnosis and the patient's age. Complications can extend the number of days in hospital. Actual length refers to the number of days actually spent in the hospital. If expected minus actual length of stay equals a positive number, and patients discharged remain healthy, it is generally accepted that it is an indication the hospitals are being more efficient. They could be using pre-admission clinics, early discharge programs, home nursing care and other ways of minimizing hospital stays.

On the average, patients spent 4.7 days per hospitalization in 2001/02. This is 0.2 days less than the expected length of stay. The gap between expected and actual has been growing over the past five years (see Figure 6.14).

Not all regions experienced a positive difference between expected and actual length of day. In Vancouver and South Vancouver Island HSDAs, where major provincial and tertiary hospitals receiving the most difficult and sickest patients are located, actual length of stay usually exceeds expectations. This was also true for many major western cities in the country like Winnipeg and Regina, Calgary (CIHI, 2002) where their provincial and tertiary hospitals are also located.

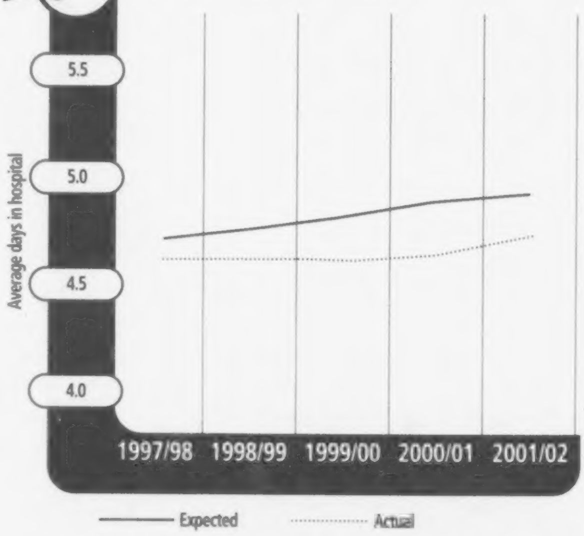
Alternate Level Of Care Days

Another indicator of appropriateness of care is the proportion of all inpatient days that are spent by patients no longer requiring acute care but who are waiting for less intensive care in another program or facility. These days are reported as alternate level of care (ALC) days and are increasing in this province. In 2001/02, 14.8 per cent of all inpatient days are ALC days. It was 12.6 per cent five years ago. This is difficult to isolate the reasons for the worsening trend. They can range from quicker classification of days spend as ALC days to more actual days spent in hospital because of sicker patients. Nevertheless, it continues to hold true that most ALC days are attributable to persons older than the age of 65 years (see Figure 6.15).

The goal is to keep ALC days to a minimum while acknowledging that they are inevitable even for the most efficient hospital, as patients wait for placement. But if this indicator is crudely translated into cases or hospital beds, it is equivalent to 1,061 patients occupying acute care beds for 365 days per year, or equivalent to using two 500-bed hospitals as a holding facility until alternative care in the home, residential facility or other

FIGURE 6.14

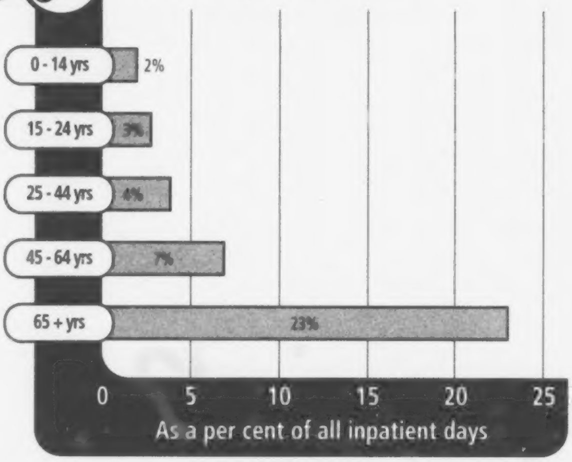
Expected compared to actual stay in hospital, B.C., 1997/98 to 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

FIGURE 6.15

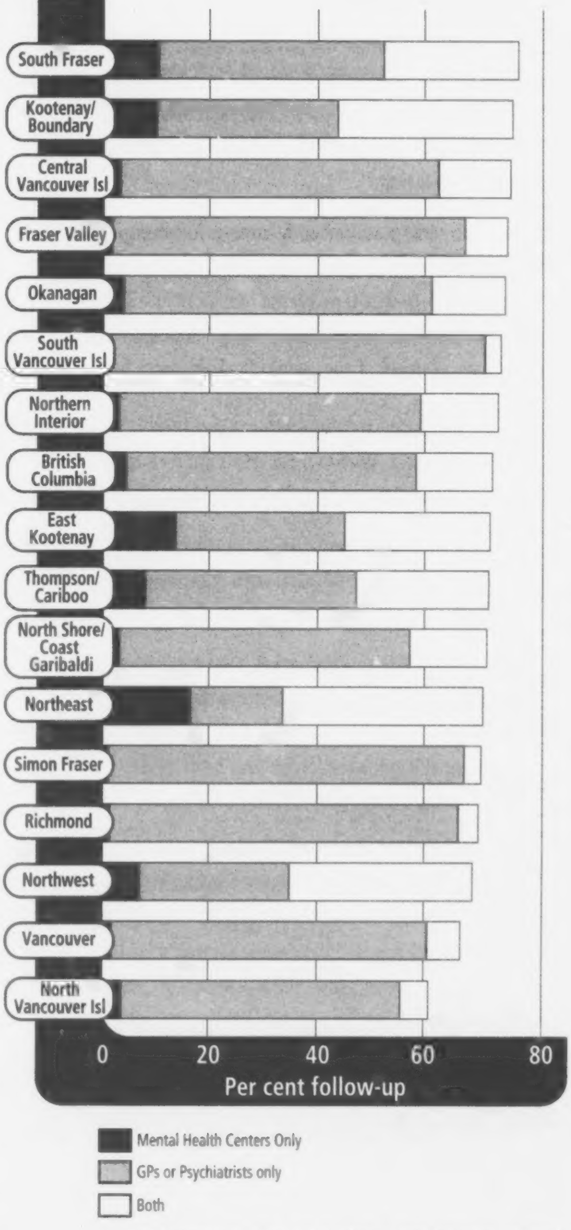
Alternate level of care days, by age groups, B.C., 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using data from the Discharge Abstract Database.

FIGURE 6.16

Community follow-up after hospitalization, B.C. Health Service Delivery Areas, 2001/02



Source: Information Support, B.C. Ministry of Health Service. Prepared using several data sources - Mental Health Data Warehouse, claims data from the Medical Services Plan and Morbidity Database.

settings is found. This could result in longer waiting times for patients that do need acute care and the delaying of major surgeries or in-hospital treatment.

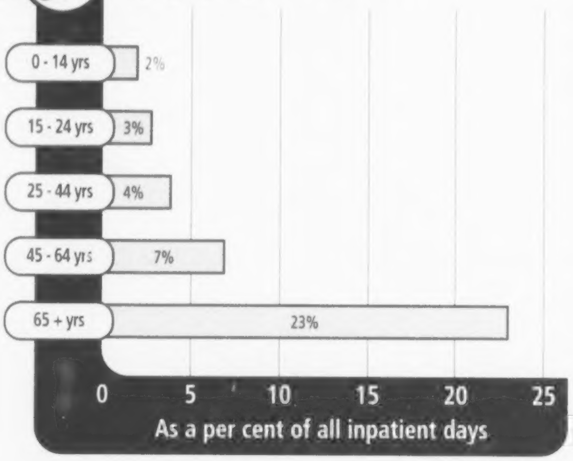
Community Follow-Up After Hospitalization

Patients who have been hospitalized for psychiatric care benefit from follow-up in the community after being discharged, either with a physician or at mental health centres. Lack of follow-up may result in re-admissions to hospital or a relapse of symptoms. The proportion of B.C. psychiatric patients who were followed up in the last few years has remained constant - seven out of every ten patients.

The majority of discharged psychiatric patients saw a general practitioner or a psychiatrist and the remainder were followed up by mental health centers. The proportion of patients being followed up after hospitalization for psychiatric reasons varies by region. Over the last five years it ranged from a low of 61 per cent being followed up in North Vancouver Island HSDA to a high of 77.5 per cent in South Fraser HSDA (see Figure 6.16).

The reorganization of regional health authorities is presenting new opportunities for the coordination and creation of services to mental health care. Mental health patients require a comprehensive and well-coordinated range of services, often requiring co-operation of other systems, beyond the health care system. Proper housing, appropriate types of employment,

FIGURE 6.15 Alternate level of care days, by age groups, B.C., 2001/02



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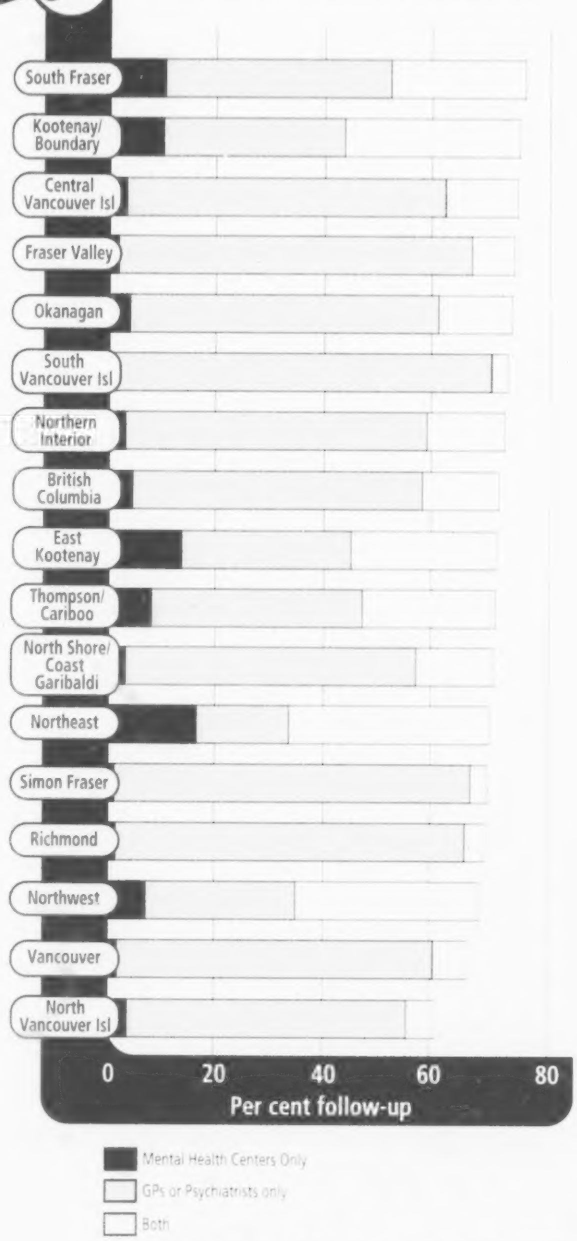

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adequate community services and supportive social networks are all important factors to ensure effective recovery and this is being promoted under the new regional health design.

Under the new performance contracts, each health region is also being required to increase the number of patients who receive follow up care for treatment of mental disorders within 30 days of release from hospital. By 2002/03, it is expected that the target of 73 per cent will be reached, essentially an increase of 3 per cent over 2000/01 baseline.

Mental health centers are currently undergoing changes in the way they report their data. A significant number of them are not reporting follow-up data through the Mental Health Data Warehouse. Consistent reporting of relevant data is needed to improve measurement of community and physician follow-up rates.

PRIMARY HEALTH CARE

Primary health care is the foundation of Canada's health care system. It is also the patient's first and most frequent way of assessing health services.

The federal government has established an $800 million 4-year (2002-2006) Primary Health Care Transition Fund (PHCTF) to support primary health care renewal. In B.C., through the PHCTF, new and innovative ways to deliver primary health care services are being developed. Primary health care renewal in B.C. focuses on integrated health care that may include health assessments, health promotion, advice on illness and injury prevention, diagnosis and treatment of episodic or chronic conditions, and supportive or rehabilitative care.

The majority (93 per cent) of B.C.'s $74 million share of the PHCTF has been allocated to the health authorities. Health authorities are using these funds to support a broad range of practice models such as primary health care organizations, community health centers, patient care networks and shared-care arrangements. These initiatives encourage integrated, patient-centred care, delivered by a multi-disciplinary team of health care providers.

Other initiatives in B.C supported by the PHCTF include the addition of pharmacist services to the BC Nurseline, the development of an electronic medical summary and a chronic disease registry for diabetes and congestive heart failure.

All activities funded by the PHCTF will undergo an evaluation that looks at the project's accessibility to patients, quality of service and cost effectiveness. This will provide a baseline to assess long-term patient health outcomes.

Where Do We Go From Here?

Overall, the health care system in our province seems to have become better at preventing admissions to hospitals and reducing unnecessary hospitalizations. If patients are hospitalized, they are staying an appropriate length of time based on their diagnosis, age and the complexity of their medical problem. No targets were set for preventable admissions to hospital, may not require hospitalizations and expected/actual length of stay. Looking to the best regional rate is one possible way to set targets for the province. This way of setting targets means the rate of today's best region becomes the target for B.C. in the next few years.

Therefore, the following could be benchmarks for future efforts:

- Preventable admission rate of 1.9 per 1,000 population to match Richmond HSDA.
- May Not Require Hospitalization of 4.5 per 1,000 population to match Vancouver HSDA.
- Expected / Actual length to match Okanagan HSDA at difference of 0.5 days.

Outside of the hospital setting, there are also some positive trends. Patients have greater access to resources for self care and are increasingly using these services. Based on estimated savings from protocols and guidelines, there are also signs that physicians are adopting best practice guidelines and providing more appropriate care.

However, it is still important to note that there are signs of "bottlenecks" in the system. Some examples are proportionally more people complaining of long waiting lists and more patients, especially seniors, staying in hospital when they are actually ready for alternative care.

Waiting time for specialized services is also of particular concern to many patients. Data from the Health Services Access Survey conducted across the country suggest the top five per cent, who waited the longest for specialist visits and diagnostic tests, waited for at least half a year for these services (Statistics Canada, 2001). Among those who waited for specialized visits, 26.7 per cent indicated that their waiting time was unacceptable. This group waited an average of 13 weeks. Those who felt that waiting time was acceptable waited only for 2 weeks.

There are areas where targets have not been met. In the 1999 Annual Report, the PHO suggested the target of 79 per cent was achievable for patients followed up after psychiatric hospitalization. Reported levels do show some movement towards this target. The mental health and addictions system is challenged to address the complex needs of people with concurrent disorders (mental disorder and substance use disorder). Health authorities have the challenge to ensure an integrated approach to care whereby mental health and addictions services are provided in an effective and appropriate manner to this population.

The proportion of births in B.C. delivered by caesarean section over the years has also been persistently higher than recommended (28 per cent versus 15 per cent of births by the World Health Organization in 1995).

Guidelines by the Canadian Medical Association and Health Canada suggest that four out of every five women with breast cancer may be treated with breast-conserving surgery. Although it does not imply that target rate should be 80 per cent, some HSDAs do have rates closer to this guideline than others. Exploring physician practice patterns and personal preferences by the female patient may help to explain the regional differences.

Where Do We Go From Here? (Continued)

B.C.'s Antimicrobial Resistance Steering Committee has an objective to reduce prescriptions by 25 per cent, by focusing on common infection such as otitis media in children. However, we know that tracking the number of B.C. children with this condition who are prescribed antibiotics is not an easy task because it taps into administrative databases that may not always answer research questions. This indicator would require more efforts to monitor the trends, including finding ways to tally the number of parents who are now more appropriately monitoring their child at home and thus do not need to seek medical attention.

The focus on strengthening access to timely care in rural and remote communities will be well served by the development of several Tele-Mental Health sites to link rural and remote communities with primary mental health sites and expand education and consultation to clinicians.

What Actions Can We Take?

Individuals:

- Learn how to identify and treat common diseases and injuries.
- Prepare for medical appointments by making a list of symptoms and questions and playing an active role in medical visits.
- Find out how your local hospitals compare with the provincial average for caesarean deliveries, breast-conserving surgery and other surgical procedure rates.

Health System:

- Implement wider adoption of chronic disease management protocols.
- Explore and implement a variety of organizational models and payment mechanisms for primary care.
- Expand public information on the appropriate treatment of common diseases through self-care handbooks, internet-based information and tele-health.
- Work together with key stakeholders in developing protocols and guidelines.
- Protect people from antibiotic drug resistance by following antibiotic prescribing guidelines and by advising parents about how to care for and comfort sick children when antibiotics are not appropriate.
- Improve coordination between hospital and community-based services so that patients who are hospitalized for physical or psychiatric reasons are able to receive the appropriate follow-up within a reasonable time frame.

Improving Health

Ultimately, the success of our health system is reflected in the health of British Columbians – their health status and the extent to which we are improving people's health, reducing sickness, and extending life expectancy and quality of life. Health services contribute, directly or indirectly, to many of the indicators presented throughout this report. Sometimes, the connection to health services is quite clear. For example, the health system plays a major role in reducing heart disease, cancer, and communicable diseases. Another example is the number of deaths that could have been prevented since they arise from diseases that are medically-treatable. There is also a brief discussion of the Pregnancy Outreach Program, which is no longer an included indicator in this section.

Deaths Due To Medically-Treatable Diseases

Deaths due to medically-treatable diseases (MTD) are based on Charlton's 1987 classification. The disease categories are those for which death could potentially be avoided through appropriate and timely medical intervention. In 2002, year to date data show that 128 deaths in the province are classified as medically-treatable and increase in raw number over previous years. After adjusting for the corresponding increase in population, the age standardized mortality rate for death due to medically-treatable diseases indicates a statistically significant decline in these deaths (see Figure 6.17).

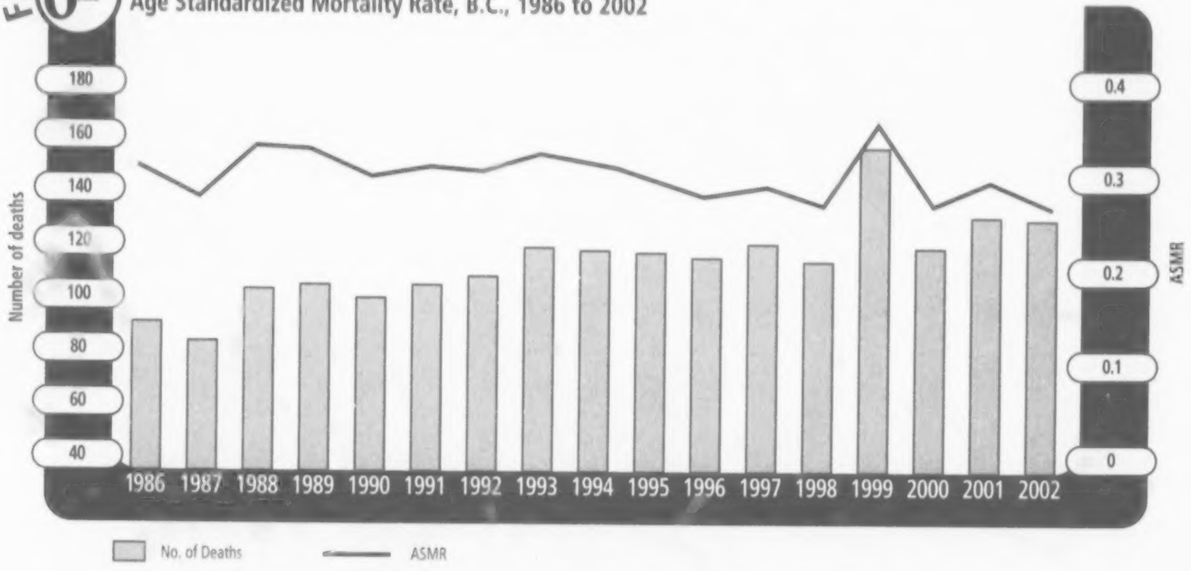
On the average, seven in ten MTD deaths are due to three disease categories: bacterial infection, cervical cancer and hypertensive disease. Deaths due to bacterial infection have been increasing at a faster rate than other conditions, as well as their proportion in relation to the total (from 8 per cent of total in 1986 to 30 per cent in 2002). They could be a result of antibiotic resistance and introduction of new pathogens.

Slightly more females than males over the years have died of medically-treatable conditions, perhaps as a result of cervical cancers being a dominant presence on the list. For males, about a quarter of medically-treatable deaths each year are due to hypertensive disease.

Despite the improving trend, we would expect that the number of deaths due to medically-treatable diseases to approach zero as all British Columbians have access to medical and hospital care. The health system needs to develop ways to identify these individuals in time for effective medical interventions to occur. About one-fifth of these deaths are due to cervical cancer, which should be detected early through Pap smears, emerging tests for the human papilloma virus (HPV) or perhaps eventually an HPV vaccine.

FIGURE 6.17

Medically-treatable diseases, Number of deaths and Age Standardized Mortality Rate, B.C., 1986 to 2002



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

Pregnancy Outreach Program

In 1999, we reported on the Pregnancy Outreach programs (POP) of British Columbia. These programs have been in place across the province for some 15 years. They serve an invaluable function in reaching about 4,000 women at risk for low birthweight babies annually, and providing prenatal and post partum supports.

In previous years, we were able to report on changed behaviours in program participants. Data clearly showed that the program led to better outcomes, such as reduced drug, alcohol and tobacco use. Recent changes in data collection mean that this critical information is not collected nor collated. This is an unfortunate state of affairs. For these reasons, this is one of the two indicators now excluded from the original 93 discussed in the 1999 Annual Report.

In addition to collecting information on risk behaviours and supports provided, these programs should develop data sets that include, at a minimum, information on calorie intake, maternal weight at intake and at delivery. As well, all health regions should be mapping the incidence of low birthweight, closely examining the populations at risk and ensuring that the Pregnancy Outreach Programs are targeted to these groups.

PATIENT OUTCOME SURVEYS

While not an indicator in our 1999 Annual report, research into clinical outcomes – how the patient fared and whether his or her health and quality of life improved after medical intervention – is becoming an increasingly valuable measure of health system performance. Under the new regional health authority performance contracts, each region is to devise valid methods for regularly surveying their patient populations to determine patient satisfaction and clinical outcomes.

This important new focus has been spurred in part by the landmark outcome research of Dr. Charles Wright, former director of the Centre for Clinical Epidemiology and Evaluation at Vancouver Hospital. Wright and his research team looked at the clinical indications for six common elective surgeries and surveyed 6,000 Vancouver-area patients before and at a series of intervals after the surgery (Wright et al., 2001). The rationale for the project was that since elective surgery is done not to extend life but to improve symptoms and quality of life, patient quality of life should be a routine measurement of surgical outcome.

Dr. Wright found that surgeries such as hip replacements and lumbar disc surgery were both highly necessary – patients had significant pain and disability prior to surgery – and 98 per cent of patients reported being much better off after the surgery. Other surgeries, however, were shown to be sometimes less necessary and less effective, occasionally even harmful. Some cataract surgeries were done when patients still had reasonable eyesight (better than 20/50 vision) and 26 per cent reported worse eyesight after the operation.

One of Dr. Wright's most important suggestions was the implementation of an assessment of patient's evaluation. Surgeons and physicians will then be able to use this information to investigate the reasons for poor outcomes in individual patients. With the outcome surveys being written into performance agreements with health regions, B.C. will become the first jurisdiction to ensure that this information is an essential part of evidence-based care. This is an important step in improving the quality and effectiveness of our health system.

FOCUS ON HEALTH SERVICES AND SENIORS

Seniors are the greatest users of our health services and account for more hospitalization days than all other age groups. The following indicators reflect seniors' use of the health system. ("Younger seniors" are those age 65 to 74; "older seniors" are those 75 years and older).

Accessibility

- In 2002/03, 71 per cent of seniors in the community and 85 per cent in care facilities were immunized against influenza.
- In 2000/01, 50 per cent of women age 60 to 69 years and only 39 per cent of those 70 to 79 had a screening mammogram.
- Of the 1,000 cases of breast cancer surgery each year among senior women, about 63 per cent of younger senior females and 51 per cent of older senior females had breast-conserving surgery.
- Half of all seniors saw a dentist in the past 12 months (CCHS, 2000/01). Ten years ago, 50 per cent of seniors had no natural teeth (1990 Health Promotional Survey). However, research suggests that an increasing number of seniors will keep their natural teeth due to improved access to dental care and increased rates of fluoridation (Millar & Locker, 1999).
- Just 6.8 per cent of B.C. seniors said they have at least one unmet health care need in the past year (CCHS, 2000/01) compared to 13 per cent of adults age 24 to 64, showing the group with the highest need report fewer unmet needs.

Doing The Right Things Right

- Seniors constitute 13.3 per cent of the B.C. population but in 2001/02, they accounted for 36.5 per cent of hospitalized cases and 55 per cent of inpatient days.
- Older seniors are expected to stay in hospital an average of 6.9 days, but over the last five years their average length of stay has been slightly shorter at 6.7 days. Younger seniors are expected to stay a shorter time (5.9 days) than older seniors and they leave the hospital on average after 5.7 days.
- At least one fifth of hospital inpatient care days spent by seniors in 2001/02 are ALC days – days they wait for a bed in a nursing or extended care facility or home care services to be made available. This proportion is even higher for older seniors at 26.9 per cent in the same year.
- Seniors are the least likely of all age groups to receive follow-up care by a general practitioner, psychiatrist or mental health center after being discharged from hospital with a mental health diagnosis. Six out of ten younger seniors discharged from hospital were followed-up within 30 days between 1997/98 and 2001/02. For older seniors, only 34 per cent received follow-up care prior to 2001/02, but that rate increased to 49.7 per cent in 2001/02.
- The rate of unnecessary antibiotic use in seniors is not known, however seniors tend to be the greatest users of almost all medication. It is known that:
    - 84 per cent of seniors who live at home took some form of medication (Statistics Canada, 1999).
    - Thirty-three per cent reported that they used antihypertensives, diuretics or both and 19 per cent reported the use of heart medication (Wilkins, 1999).

FOCUS ON HEALTH SERVICES AND SENIORS (CONTINUED)

- An estimated 10 to 30 per cent of elderly hospital patients are admitted because of medication toxicity (Millar, 1998). Research has shown that the risk of inappropriate drug combinations increases with the number of physicians prescribing medications, but visiting a single primary care physician and a single pharmacy may prevent inappropriate drug combinations (Tamblyn et al., 1996).
- Multiple medication increases with age. National data show that 29 per cent of younger seniors and 37 per cent of older seniors use three or more medications (National Population Health Survey, 1994/95).

TABLE 6.2 UTILIZATION OF HEALTH RESOURCES BY SENIORS

Type of health services	Proportion of	Per cent
	Population who are seniors (2002)	13.3
Doctor services (2001/02)	Doctor services provided to senior patients	29.5
	MSP expenditure for doctor services provided to senior patients	29.2
Hospital services (2001/02)	Inpatient days occupied by seniors	55.0
	Hospitalized cases who are seniors	36.5
Pharmacare (2001)	Pharmacare beneficiaries who are seniors	50.1
	Pharmacare expenditure for medication (Plan A) provided to senior patients	53.7

Source: B.C. Ministry of Health Services. Drugs: *Pharmacare Trends 2002*, Hospital: unpublished tables from Information Support, Doctor: *Information Resource Manual 2001/02*. Population data from BC STATS, B.C. Ministry of Management Services.

Besides medication, utilization share of health resources by seniors are also extensive. Table 6.2 further illustrates that while seniors constitute only 13.3 per cent of the B.C. population, their utilization share for publicly funded drug programs, hospital and doctor services are two to three times their population share. We can anticipate that as the population ages, these proportions will grow as quickly or quicker than their population share.

The Government of B.C. is taking a more holistic approach in the provision of health care services to seniors. The strategy is to be patient-centered - allowing innovative community and home care as alternatives to institutional care and involving non-health sectors in the provision of care. For seniors, (and some segments of the population like the disabled), home care as a substitute for long term care facilities has proven to be cost-effective and can result in better care and quality of life (Hollander & Chappell, 2002). Home based palliative care, for example, enables patients to die in familiar surroundings with family and friends nearby.

Many predict that utilization of health services will increase as the population ages. By 2023, when 23 per cent of the population will be age of 65 or older, this is expected to present a considerable challenge. However, as we have shown in other chapters in this report, the B.C. population is aging with less disability and disease than past generations. If we focus on providing preventive care and good chronic disease management, these challenges can be managed. In addition, the focus on preventing unnecessary care, and improving effectiveness and appropriateness of treatment that has been outlined in this chapter will not only improve the use of health services, it will also improve seniors' health and quality of life.

HEALTH GOAL 5

CHAPTER 7

Aboriginal Health

GOAL 5: ABORIGINAL HEALTH

Health Status

Self-rated health – *Not much change*
Infant mortality rate – *Improving*
Potential years of life lost – *Improving*
Life expectancy – *Improving*

Factors affecting health

High school completion rate – *Improving*
Unemployment rate – *Improving*
Low income rate – *Improving*
Community control – *Improving*

Improved health for Aboriginal peoples

Aboriginal people in B.C. have experienced longstanding inequalities in both health and social status. This is due to many complex reasons, including the historical loss of cultural and political institutions, colonialism, racism, and residential school experiences that have had multigenerational impacts. While much of the health status data reflect continuing unacceptable inequities in health status, there is also evidence of significant improvements in health status. Aboriginal infant mortality is dropping and life expectancy is increasing. Immunization rates are equal to that in the general population. Rates of unintentional injuries are improving. Indeed, if 1990s trends continue, Status Indians (the only Aboriginal group for which most statistics are available) could achieve a level of health comparable to other British Columbians some time during the next decade.

The findings above were among the key results of the *Provincial Health Officer's Annual Report 2001: The Health and Well-being of Aboriginal People in British Columbia*. Based on extensive work with Aboriginal communities, the report for the first time provided an update on British Columbia's progress toward the goal of improved health for Aboriginal people. Sixty indicators were used to describe health status, community environments, healthy growth and development, the physical environment, health services, and disease and injury prevention. Of the 60 measures, 20 showed an improving trend, seven were static and three were worsening. The worsening indicators were the number of aboriginal children in care, alcohol-related deaths, and deaths from HIV/AIDS. Trend data were not available for 25 of the indicators. On the average, the 2001 Annual Report found that Aboriginal persons living in British Columbia have a standard of living that is likely to be 20 per cent below the provincial average for measures such as income, employment, educational attainment, and housing adequacy.

However, the report also describes programs and strategies that are innovative and effective in improving the health of Aboriginal people. Targeted programs in a climate of cultural and political resurgence were often effective. Indeed, Aboriginal health status was found to be highest in the northern areas of the province where formal health services are least available. This unusual finding may indicate positive health protection comes from communities that have social, cultural and political integrity.

As the 2001 Annual Report noted, comparable health status between Aboriginal people and the general population is the only ethically acceptable target. The challenge is in determining how quickly that goal can be achieved, and which specific targets to aim for first.

This section is based substantially on the 2001 Annual Report, and a few of the key indicators that were used in the 1999 Annual Report section on Aboriginal Health. The indicators were:

- **Health Status** – self-rated health, infant mortality, premature death (potential years of life lost, or PYLL), and life expectancy.
- **Factors Affecting Health** – income, unemployment, education, and measures of community control.

ABORIGINAL PEOPLES

There is a patchwork of information regarding the health status of Aboriginal people. We know the most about the Status Indian population who are roughly two-thirds of the total Aboriginal population. We know much less about non-status First Nations, Métis people, and Aboriginal people living in urban areas.

The term Aboriginal, as recognized in the 1982 *Constitution Act of Canada*, refers to First Nations, Métis, and Inuit peoples as a group. First Nations has replaced the term Indians and is preferred by Aboriginal people who are descendants of the first inhabitants of Canada. It is not a legal definition and refers to both Status Indians and non-Status Indians. Status Indians (sometimes referred to as registered Indians) are entitled to the provisions of the *Indian Act*, and can be either Treaty or non-Treaty Indians. In B.C., most First Nations did not sign treaties, although they are currently negotiating modern-day treaties. The Inuit are a distinct population of Aboriginal people, most of whom live in northern Canada. The Métis are people of mixed First Nations and European ancestry who identify themselves as Métis, as distinct from Indian people, Inuit or non-Aboriginal people, with roots to the fur trade and Red River settlement. Most Métis people live in the three Prairie provinces. Unlike Status Indians and Inuit, the Métis are not entitled to the provisions of the *Indian Act*.

Health Status

Conventional health status indicators discussed in this section include infant mortality, potential years of life lost and life expectancy. Self-rated health is also discussed, as an overall measure of well-being. However, these indicators of health do not necessarily reflect Aboriginal concepts of health. Aboriginal well-being has traditionally involved more than the simple absence of disease and illness. Aboriginal people embrace a holistic definition of health as involving spiritual, physical, economic and political aspects that enable individuals to participate fully in family and community life.

What Do The Data Show?

- The health status of Aboriginal people is improving, based on standard measures of health status.
- For infant and all-age mortality rates, the gap is narrowing between Status Indians and other British Columbians. If these trends continue, Status Indians could achieve rates comparable to other British Columbians sometime during this decade.
- Aboriginal people have a level of health below that of the general population. Status Indians in B.C. can expect to live 7.5 years less than other B.C. residents. For almost every cause of death, Status Indians die at higher rates and younger ages. HIV/AIDS and alcohol-related deaths show a worsening trend.
- Status Indians living in the Okanagan, Fraser Valley and some HSDAs in the Northern Health Authority have the highest levels of health, based on life expectancy, mortality, and premature deaths. Status Indians in the Vancouver and Simon Fraser HSDAs have the poorest results on these measures.
- Aboriginal people suffer more than the non-Aboriginal population from chronic diseases: 3.2 times more for diabetes and 3.4 times more for arthritis. The number of people experiencing these chronic conditions will increase in the coming years because of population growth and because health and illness patterns are shifting from infectious to chronic diseases.

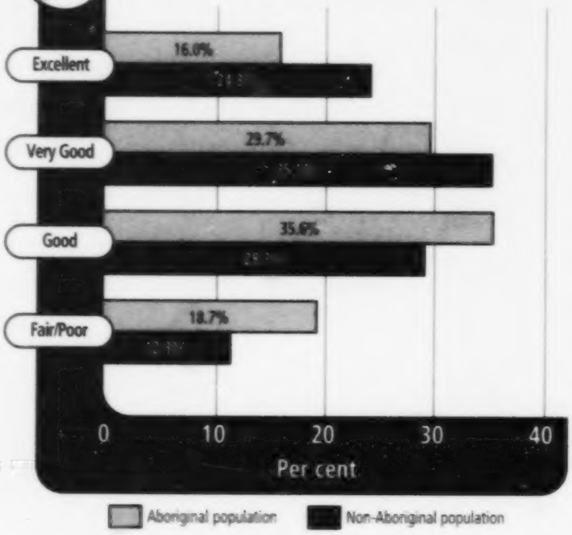
Self-Rated Health

Aboriginal people are less likely than non-Aboriginal people to rate their own health as "excellent" or "very good". In 2000/01, 16.0 per cent of Aboriginal people in B.C. rated their health as "excellent", compared to 24.3 per cent of non-Aboriginal people (see Figure 7.1).

More Aboriginal people are also rating their health as "poor" or "fair" now than a decade ago. In 2000/01, 18.7 per cent were self-rated as "poor" or "fair", slightly higher than the 13 per cent from a decade ago (based on data from the Post Censal Survey 1991 that had similar questions on self-rated health).

Aboriginal people of B.C. are affected by chronic diseases such as heart disease, arthritis and diabetes at higher rates than the general B.C. population. Prevalence rates are 3.2 times higher for diabetes, 3.4 times higher for arthritis and 3 times higher for tuberculosis (Provincial Health Officer, 2002). The average age of onset also tends to be younger for many chronic diseases. For example, results from the B.C. First Nations Regional Health Survey (First Nation's Chiefs' Health Committee, 2000 March), revealed that arthritis, a disease typically more common among the elderly, is identified at an average age of 35 years among the Aboriginal population. In addition, nearly one third of Aboriginal

FIGURE 7.1 Self-rated health, Aboriginal and non-Aboriginal population, B.C., 2000/01



Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

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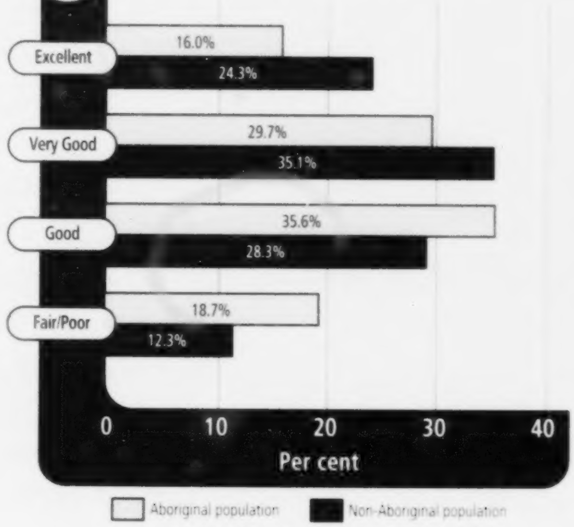


Source: Statistics Canada, Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

Canadians report having a disability, more than double the national rate. Higher prevalence rates and earlier onset of these health problems may partially explain the poorer scores on self-rated health of for B.C.'s Aboriginal peoples.

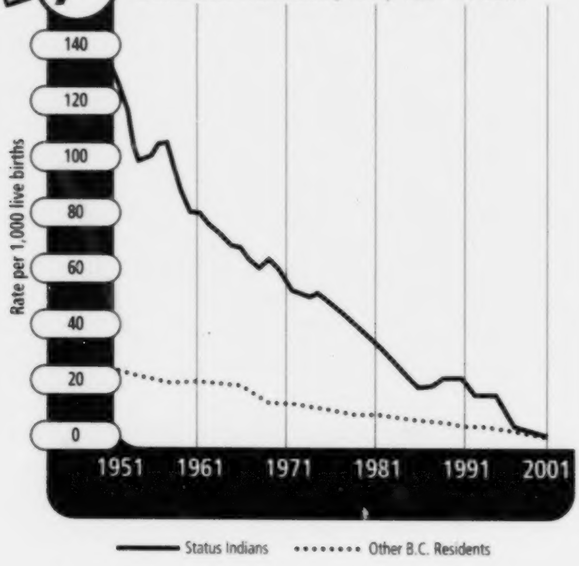
Infant Mortality

Infant mortality for Status Indians has dropped dramatically. In the 1950s, one in every ten Status Indian babies died during the first year of life – a rate five times the provincial average. In 2001, the rate was 4.3 per 1,000 live births, approaching the B.C.'s population rate of 3.9 per 1,000 live births (see Figure 7.2).

Mortality rate

Mortality rates for all ages are also improving, and the gap between Status Indians and the rest of the population is narrowing. In 2001, the Status Indian mortality rate was 1.5 times that of the general population. A decade ago, the rate was twice the provincial rate. The causes of death responsible for the largest number of Status Indian deaths in 1991 to 2001 were ischemic heart disease, motor vehicle accidents, accidental poisoning, suicide and cerebrovascular disease.

FIGURE 7.2 Infant mortality rate, Status Indians and Other B.C. Residents, B.C., 1951 to 2001



Note: Rates plotted as a moving average.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

Premature Death (Potential Years of Life Lost or PYLL)

Every death occurring to a person less than age 75 is considered premature and therefore contributes to the potential years of life lost total.

In British Columbia, the rates of potential years of life lost for Status Indian are decreasing but are still 2.7 times higher than the general population. Over the period 1991 to 2001, there were 8,072 Status Indian deaths [illegible] which 76.4 per cent were under the age or 75 years at the time of death. This represented 4.9 per cent of the total premature deaths and 8.2 per cent of the total potential years of life lost for the period 1991 to 2001 in the province.

By region, PYLL standardized rates for Status Indians are higher than other B.C. residents for all HSDAs. In Vancouver HSDA, this rate for Status Indians is four times that of other B.C. residents for 1991 to 2001 (see Figure 7.3).

Life Expectancy

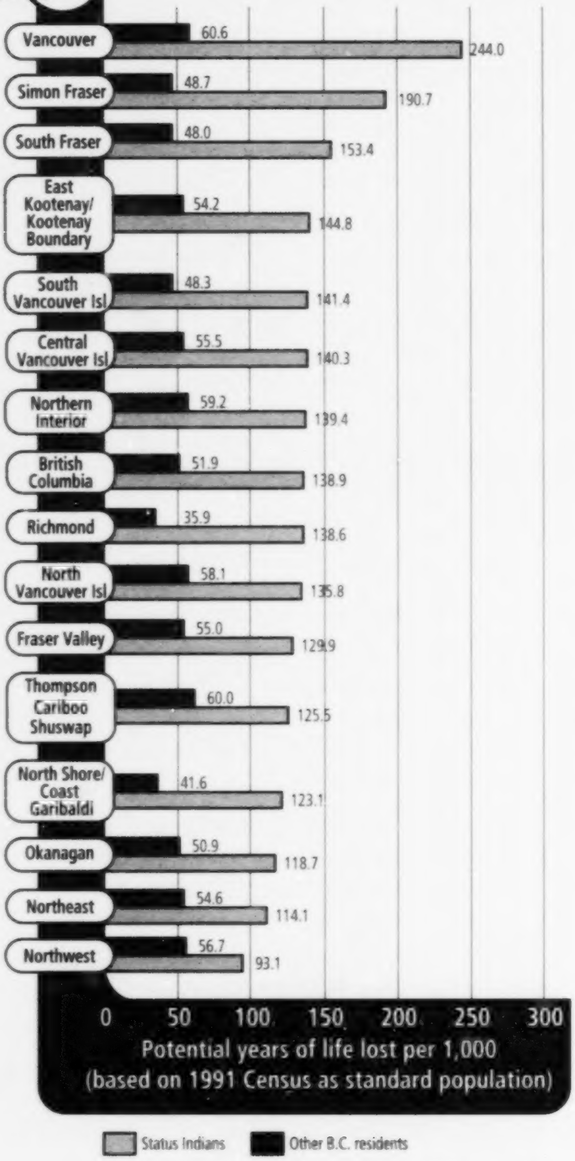
Life expectancy of Status Indians is improving, with the gap in life expectancy between Status Indians and other B.C. residents closing. Nevertheless, improvement is possible.

Status Indian females can expect to live 75.4 years (1997-2001), while other female B.C. residents can expect to live 82.0 years. Life expectancy for Status Indian males is 69.9 years, eight years less than other male B.C. residents. Average life expectancy for Status Indians is still five years less than life expectancy for the lowest income tercile in the province (see Figure 7.4).

For B.C. Status Indians, most causes of death showed an improving trend in the 1990s with the exception of diabetes, lung cancer, HIV/AIDS and falls. Alcohol-related deaths have undergone a change in reporting methodology in recent years and it appears that numbers are stable or even improving slightly. However, Aboriginal communities have identified alcohol abuse as a significant community issue in most surveys and focus groups, with the majority of respondents (56 per cent) saying in the last two years they had seen no progress in improving alcohol and drug abuse (First Nations Chiefs' Health Committee, 2000 March). There is no B.C. data on the frequency of Fetal Alcohol Spectrum Disorder, but studies of some Aboriginal communities suggest a rate that is 10 times higher than in the general population.

FIGURE 7.3

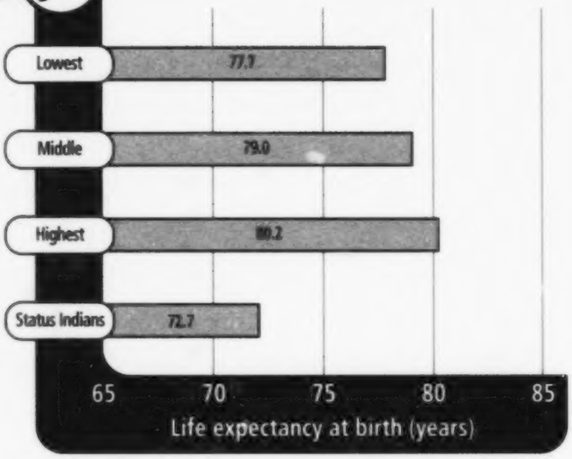
Potential years of life lost standardized rate, Status Indians and Other B.C. Residents, B.C. Health Service Delivery Areas, 1991 to 2001.



Source: British Columbia Vital Statistics Agency. (2002 September). Prepared using data from *Regional Analysis of Health Statistics for Status Indians in British Columbia*. http://www.vs.gov.bc.ca/stats/indian/indian2001/index.html

FIGURE 7.4

Life expectancy at birth by neighbourhood income category, B.C. population, 1996 and Status Indians, B.C., 1997 to 2001



Source: Neighbourhood income category - the B.C. population was grouped into 3 categories (terciles), after ranking enumeration areas by income per single-person equivalent within each Census Metropolitan Area.

Sources: (1) B.C. Population: Statistics Canada. (May 2002). Life Expectancy at Birth, by Neighbourhood Income Tercile, Canada and Provinces, 1996, Unpublished table provided by Russell Wilkins, Health Analysis and Measurement Group. Original Data Source: Deaths 1996-97. Census Population 1996, Statistics Canada. (2) Status Indians: Life expectancy at birth, 1997-2001, B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

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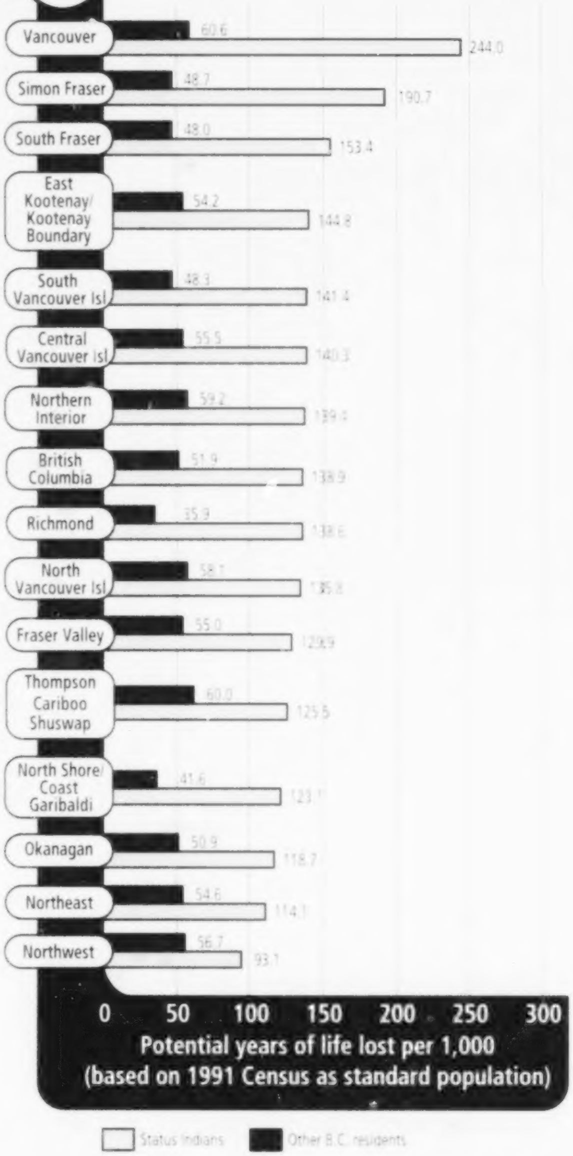

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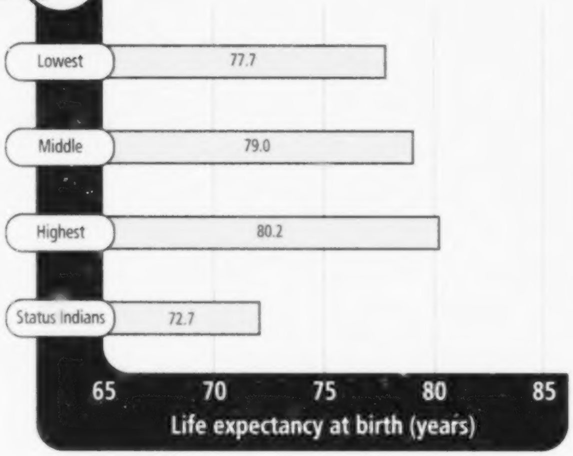

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FIRST NATIONS HEALTH WISDOM

Traditional First Nations communities had considerable skills in health and healing. They prevented scurvy by brewing tea from vitamin C-rich spruce bark, reduced pain by using willow extract, and numbed labour pain with herbs and other plants. Healers, shamans, and medicine men and women underwent years of apprenticeship and were integral parts of many communities. The onset and devastation of disease following contact with European cultures along with colonialism proved disruptive to many of these cultural practices.

Many Aboriginal people now struggle to access basic health care and can face geographic, political, linguistic and cultural barriers to optimum care. The B.C. First Nations Health Handbook, from the B.C. Ministry of Health Planning, is just one step to recognize and address First Nations health issues by providing all Aboriginal citizens with culturally sensitive health information. The handbook helps individuals to take charge of their health and lists the full range of services that are available to them, including the B.C. NurseLine, which provides advice for illness in some aboriginal languages. It also allows users to check their symptoms and seek appropriate treatment for 190 common health concerns.

The handbook, NurseLine and Online health services are all tools to help address the challenges of rural/remote health care needs while targeting the specific needs of Aboriginal people.

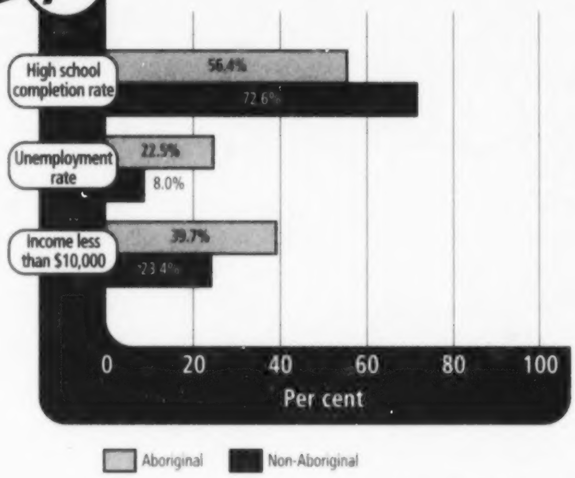
Factors Affecting Health

As with all British Columbians, the health status of Aboriginal people is fundamentally affected by income, employment and education and other factors, such as the ability to control one's social, cultural and political life. All these factors either subtly or overtly impact an individual's ability to realize his or her full potential.

What Do The Data Show?

- The Aboriginal population has levels of employment, income, and educational attainment that are about 80 per cent of those of other British Columbians. However, comparing data from the census of 1996 and 2001, more Aboriginal people have completed high school, and fewer are unemployed or earn less than $10,000 a year.
- Suicide rates are lower for First Nations bands that have made progress toward self-government and land claims, have cultural facilities, and have control over local services such as health care, education, police, and fire.

FIGURE 7.5 Factors affecting health, Age 15 years and over, Aboriginal and non-Aboriginal population, B.C., 2001



Source: Statistics Canada. Prepared using data from the 2001 Census, provided by BC STATS, B.C. Ministry of Management Services.

Income, Unemployment and Education

Aboriginal people with paid employment earn substantially less than the provincial average, mostly due to part-time or part-year work, but also because they work in lower paid and lower status occupations. According to the 2001 Census, based on data about people who report Aboriginal identity, about 40 per cent of the Aboriginal population (age 15 years and older) in B.C. has a total income of less than $10,000 per year. This proportion is almost twice the non-Aboriginal population of the province. The unemployment rate for the Aboriginal population is almost three times the non-Aboriginal population. And their levels of educational attainment are about 80 per cent of those of other British Columbians (see Figure 7.5).

A large proportion of the Aboriginal population lives below the poverty line and many rely on government assistance of some type. Child poverty is of particular concern because of its association with a variety of poor outcomes later in life, including abuse, poor school performance, teen pregnancy and unemployment. Forty-one per cent of Aboriginal children live in families with incomes under $20,000, compared to 17 per cent for other B.C. children (Provincial Health Officer, 2002).

Aboriginal peoples in B.C. also face a higher level of unemployment, at 20.4 per cent for the off-reserve population, and 28.9 per cent for on-reserve Aboriginal populations according to 2001 Census data. A key challenge is finding well-paying jobs in small, remote communities. Many communities are looking to renewable resource activities in their areas, to tourism, and to gaining more control over resources through negotiating treaties with the provincial government.

The proportion of Aboriginal population age 15 years and over with high school education has increased during the last five years, with 56.4 per cent of them indicating that they have completed high school in 2001. The rate was 50.8 per cent in 1996. However, the aboriginal population is still not achieving the educational levels of the overall B.C. population. The high school education completion rate for British Columbia's non-Aboriginal population was 72.6 per cent in 2001.

Research is indicating that schools and districts that focus on academic learning, clear goals, cultural relevancy, and strong family and community involvement tend to have good Aboriginal student achievement. Many promote links to traditional culture and language through enhancement agreements between Aboriginal councils and school districts. This has occurred in Kamloops, Campbell River, Maple Ridge, Cowichan Valley, Nanaimo and Comox Valley.

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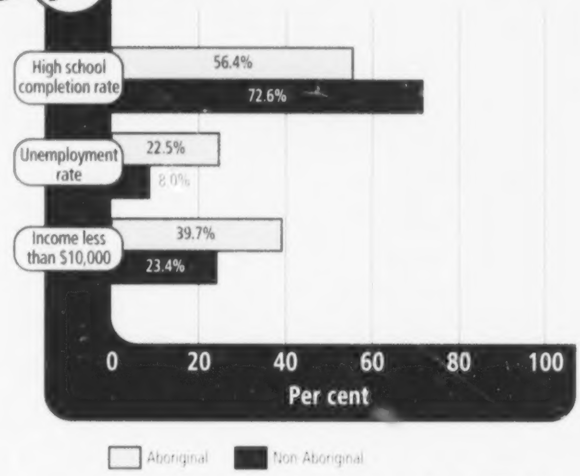

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Measures Of Community Control

Aboriginal communities across the province vary greatly, and there is much work to be done to bring them up to the standard of living of other British Columbians. Progress, however, is being made. Increasingly, evidence indicates the pattern of poverty and poor health can be broken. A Harvard University project examining the dynamics of self-governance and economic development on American Indian reservations reported to the B.C. Treaty Commission Forum in 2001 that successful communities were those that had genuine decision-making power – not just administrative control over decisions made elsewhere. Indeed, indigenous peoples throughout the world have struggled to gain control over their land and lives and win recognition of their right to self-determination.

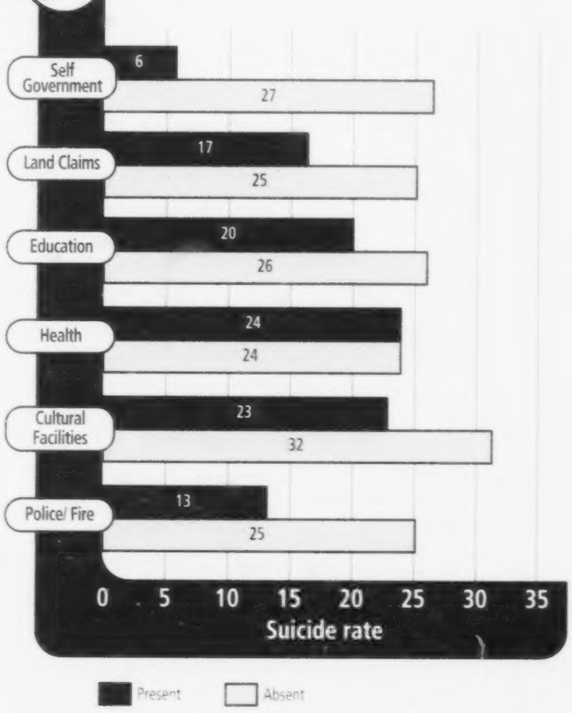
Quantifying and measuring community control can be a complex task, measured by degree and ranging from legislative capacity to economic development to active cultural practice. Data in the 1999 Annual Report for measures of community control are no longer collected or are not collected in the same way by the previous sources.

However, there are other measures to show that Aboriginal communities in B.C. are beginning to gain more governance over the programs and services they receive and have genuine decision-making power and a collective sense of control. The 2001 Annual Report noted about 65 per cent of the province's registered Aboriginal population are currently engaged in treaty negotiations, which deal with issues such as land ownership and self-government. More than half (58 per cent) of bands have taken responsibility for community health services provided on reserve, or are in the process of doing so. About 56 per cent of Aboriginal communities have assumed some level of responsibility for child and family services. These figures show that the majority of on-reserve communities are on the road to self-government.

Suicide rates have been called "indicators of needy communities" (Provincial Health Officer, 2002; Cooper, 1995). The 2001 Annual Report found suicide rates are lower for First Nations bands that have made progress toward self-government and land claims, have cultural facilities, and have control over local services such as health care, education, police, and fire. Indeed, their suicide rates were 6 per 100,000, compared to 27 per 100,000 for communities without such progress. This evidence fits with what is known about the factors that influence health: individuals and communities are healthier when they are empowered and have a sense of control over their lives and destinies.

FIGURE 7.6

Suicide rates per 100,000 by community control factors, First Nations Communities in B.C.



Notes: Community control- First Nations Bands that have made progress toward self-government and land claims, have cultural facilities, and have control over local services as such health care, education, police, and fire.
Source: Suicide rates among First Nations Persons in B.C., 1993 to 2000. Prepared by C. E. Lalonde for the Office of the Provincial Health Officer, 2001.

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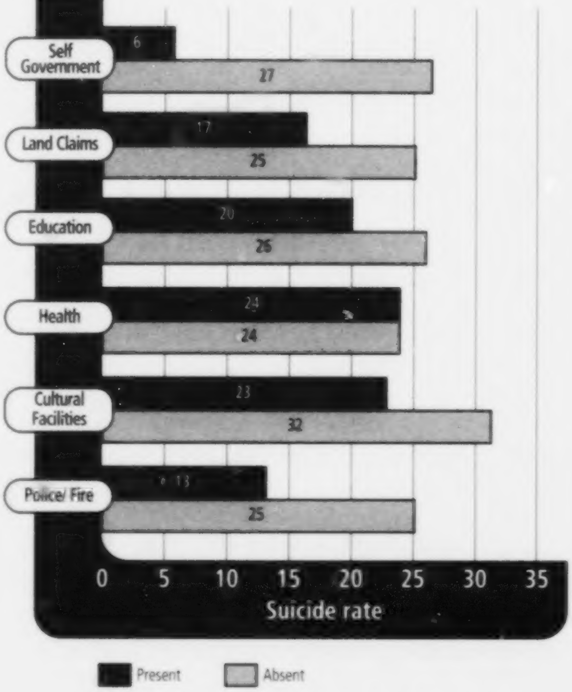

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THE HIV/AIDS CHALLENGE

A new B.C. study shows that even among known high risk groups, such as injection drug users (IDUs), the Aboriginal population's rate of infection with HIV is twice that of the non-Aboriginal IDU population (Craib et al., 2003). The study recruited 941 IDUs in Vancouver from May 1996 to December 2000, of whom one quarter were Aboriginal. All participants were seronegative at the time of enrollment. By May 2001, 21.1 per cent of the Aboriginal participants compared to 10.7 per cent of the non-Aboriginal participants had become HIV positive.

The authors note that drug use helps people cope with the complex effects of discrimination, poverty and social dislocation, including the multigenerational effects of the residential school system. "These data combine to underscore the grave potential for further spread of HIV infection among Aboriginal people," the study notes. The authors emphasized the urgent need for an appropriate and effective public health strategy. The authors recommend the strategy be planned and implemented in partnership with Aboriginal AIDS service organizations and the Aboriginal community to reduce the harms of injection drug use in this population.

Where Do We Go From Here?

The PHO's 2001 Annual Report identified eight major Aboriginal health issues that need special attention. These will require holistic approaches to health as well as prevention strategies, community involvement, cultural sensitivity and outreach:

- **Infant Health:** SIDS rates declined sharply during the 1990s, but further actions promoting healthy growth and development are crucial during early childhood. The B.C. government worked with the PHO to introduce two new vaccines against pneumococcal and meningococcal disease in early 2003. Aboriginal children have been prioritized as a higher risk group.
- **Tobacco Use:** Smoking rates are twice the rate of the general population at 45 per cent. Numerous programs aimed at youth and families are underway.
- **Alcohol and Drugs:** These continue to take a huge toll, in spite of resources devoted to the issue. Their use reflects social and cultural stresses and require comprehensive efforts addressing social conditions, prevention, treatment and harm reduction.
- **HIV/AIDS:** This is one of the few causes of death where the gap in health status is widening. The Red Road is an Aboriginal strategy for HIV and AIDS in B.C. that makes 50 recommendations to address the issue. The response to these recommendations should be strengthened and implemented. Aboriginal people make up 16 per cent of those testing newly positive for HIV, although they are only 4 per cent of the B.C. population. Some of the factors that explain higher HIV/AIDS rates among Aboriginal people are higher rates of injection drug use, sexual activity among teens and sexually transmitted diseases, as well as higher rates of sex trade work and incarceration, where risk activities are high.
- **Diabetes:** This is a critical issue with Aboriginal people in Canada experiencing more than three times the rate of the general population. It is becoming more common and is occurring increasingly in younger people and women. Complication rates are high, and include kidney disease, heart disease, blindness and amputations. A national initiative is under way to prevent and manage the disease better among the

Where Do We Go From Here? (Continued)

Aboriginal population. In B.C., there has not been ongoing surveillance of the illness, but a diabetes database has been established with results expected in 2002.

- **Injuries:** Despite a falling trend, injuries remain the most common cause of death for Aboriginal people and include motor vehicle crashes, accidental poisoning (including drug overdose deaths), suicide, falls, fires and drowning. Injury prevention plans can be developed and implemented at the community level.
- **Primary Care:** While most Status Indians visit a doctor or health practitioner in a given year, it is not clear they are receiving the services they need. More information is necessary to ensure positive outcomes. Universities and colleges are striving to increase the number of Aboriginal students enrolled in the health care professions, a key step to providing more culturally sensitive health delivery.
- **Informational Databases:** Most of the available health statistics on Aboriginal people relate to those who are registered with Indian and Northern Affairs Canada, or who live on reserve. There is a critical need for accurate, region-specific data about the health problems that Aboriginal people experience, including non-status First Nations, Métis, and Aboriginal people living in urban areas. More collaborative work is needed to create health databases.

The 2001 Annual Report outlined 40 examples of actions that can be taken to help improve Aboriginal health status in B.C. Overall, these include improved access, greater Aboriginal control and involvement, and improved working relationships with the health system. As well, a major obstacle to health service for Aboriginal people is lack of jurisdictional clarity, which has created a significantly fragmented, inconsistent and inadequate system of care. Greater coordination between various levels of government, particularly between the federal and provincial government, is greatly needed in the delivery of health services.

The 2001 Annual Report also sets targets that the PHO feels are achievable. They include:

- Achieve infant mortality rates for Status Indians equal to the general population by 2005.
- Increase immunization rates among two-year-old children to 85 per cent by 2005.
- Reduce Aboriginal Status Indian death rates due to HIV/AIDS to the 1991-2000 average rate of 1.2 per 10,000 by 2005 – effectively halting the worsening trend.
- Reduce the Status Indian injury death rate by 50 per cent from the 1991-2000 baseline (17.7 per 10,000) by 2005.

What Actions Can We Take?

The key recommendations in the 2001 Annual Report were:

- Make formal commitments – establishing provincial and regional targets for achieving comparable health status between the Aboriginal population and other British Columbians, holding ministries and health authorities accountable for progress toward those targets, and coordinating agencies that serve the same populations.
- Improve standard of living – working collaboratively to improve housing conditions and economic and educational opportunities for Aboriginal people.
- Provide more recognition and respect – increasing awareness of the health status of Aboriginal men and women and the health issues and challenges that Aboriginal men and women face.
- Use a more holistic approach - paying more attention to the non-medical, cultural, and spiritual determinants of health, encouraging participatory research to gain a clearer understanding as to why some Aboriginal communities are "healthier" than others and identifying and collecting indicators that are meaningful and useful to Aboriginal communities.
- Provide more autonomy - supporting efforts by Aboriginal people to achieve self-determination and a collective sense of control over their futures, in both on- and off-reserve communities.
- Encourage more representation – ensuring greater Aboriginal participation in health governance and in the design and delivery of culturally-appropriate health services.

The B.C. Ministry of Health Services has adopted a long-term target to achieve comparable health status between Aboriginal people and the general population (B.C. Ministry of Health Services, 2003.) The government will report on progress made when each year's public accounts are presented.

FOCUS ON ABORIGINAL ELDERS

The term "seniors" is seldom used to describe elderly people in the Aboriginal community. Instead, they are more often referred to as "elders" – individuals who have gained wisdom from life and use that wisdom to educate others in their community. The following information is presented acknowledging that an arbitrary age of 65 years may not always be appropriate in the Aboriginal context. Instead, it is a means of categorizing data, consistent with the description of seniors in other chapters.

Of the 170,000 Aboriginal people in B.C., only 7,240 Aboriginal persons (or about 4 per cent) are over the age of 65 years. This is low compared to the overall B.C. population where about 13 per cent are seniors.

The Aboriginal population of B.C. is much younger than the provincial population. The median age of the B.C.'s Aboriginal population is 26.8 years. Their non-Aboriginal counterparts have a median age of 38.2 years. Because of the small number of Aboriginal seniors in this province, data on them are scarce. The following facts are known about Aboriginal seniors in B.C. and the country:

- Aboriginal seniors in B.C. are mostly North American Indians (68.8 per cent) and Métis (27.6 per cent). There were only 20 Aboriginal seniors who identified themselves as Inuit in the 2001 Census.
- National data show that Aboriginal seniors are more likely to live on reserves than their younger counterparts (Statistics Canada, 1999). According to the 1996 Census, among the Registered North American Indians, 67 per cent of seniors lived on reserve, versus only 59 per cent of those under 65 years.
- Aboriginal seniors are also most likely to know and use an Aboriginal language (54 per cent in 1996, almost twice that of younger Aboriginal people).
- For education, 75.3 per cent of Aboriginal seniors in B.C. have not completed high school compared to 50 per cent of non-Aboriginal seniors.
- From 1991 to 2001, there were altogether 8,072 deaths for Status Indians, of which 3,223 were over the age of 65 years in the province. This constitutes about 40 per cent of all deaths for that period. This is markedly different to the non-Status Indian population, where seniors constitute 77.6 per cent of all deaths in the same period. This is due to the excessive premature mortality from external and internal causes experienced by younger Status Indians.

As with the overall population, the Aboriginal population is also aging and living longer. In fact, the proportion of those aged 65 years and over is expected to grow in the next decades. The Royal Commission on Aboriginal Peoples estimated that the number of Aboriginal seniors will almost triple between 1996 and 2016 and seven per cent of all Aboriginal persons will be aged 65 and over (Norris, Kerr & Nault, 1995).

HEALTH GOAL 6

CHAPTER 8

Disease and Injury Prevention

GOAL 6: DISEASE AND INJURY PREVENTION

Non-communicable diseases

Heart disease and stroke deaths – *Improving*
Cancer incidence and mortality – *Improving*
Respiratory disease deaths – *Not much change*
Mental health hospitalizations – *Not much change*
Neural tube defects – *Improving*

Communicable diseases

Vaccine-preventable diseases – *Improving*
Tuberculosis – *Not much change*
HIV infection – *Worsening*
Sexually transmitted diseases – *Worsening*
Food and waterborne diseases – *Improving*
Waterborne diseases outbreaks – *Improving*

Injuries

Unintentional injuries – *Improving*
Hip fractures – *Not much change*
Domestic violence – *Not much change*
Child abuse and neglect – *Not much change*
Illicit drug overdose – *Improving*
Suicide – *Improving*

Reduction of preventable illness, disabilities, and premature death.

Many health problems that British Columbians experience are to a significant extent preventable. Goal 6 highlights some of the major diseases and conditions that affect us and the prevention or early intervention strategies that could lessen their impact. The following categories and their indicators are used in Goal 6:

- **Non-Communicable Diseases** – heart disease and stroke deaths, cancer incidence, cancer deaths, respiratory disease deaths, mental health hospitalizations, and neural tube defects.
- **Communicable diseases** – vaccine-preventable diseases, tuberculosis, HIV infection, sexually transmitted diseases, food and waterborne diseases.
- **Injuries** – unintentional injuries (all causes), hip fractures, domestic violence, child abuse and neglect, illicit drug overdose, and suicide.

In general, trends in these categories have not changed much since the 1999 Annual Report.

Non-Communicable Diseases

Non-communicable diseases encompass a wide array of health conditions. As in the 1999 Annual Report, specific diseases have been included under Goal 6 only if an indicator and information systems are available to systematically measure health status changes. In the future, more non-communicable health conditions could be added if reliable indicators become available.

In this section, we look at death rates from heart disease, cancer, and respiratory disease. Deaths alone, however, do not capture the full impact of a disease particularly if it is widely prevalent and severely disabling but does not always lead to death. This problem of capturing the full impact of a health condition is addressed by using the Burden of Disease methodology initiated by the World Bank and Harvard University. The burden of each disease is calculated through a formula called the Disability Adjusted Life Years (DALYs) that takes into account the years of life lost due to the disease as well as the years lived with disability. The calculation of DALYs allows for a more accurate picture of the true impact of the disease. Using DALYs, it is possible to examine the total impact of different disease conditions on the population of the province.

The burden of illness can also be examined in terms of the economic costs associated with each disease. The total economic burden of illness for B.C. was estimated at $22 billion, based on 1998 data (Health Canada, 2002). This economic burden of disease is calculated by looking at (a) direct costs for hospital stay, drugs, physician services and other treatment related expenditures and (b) indirect costs, defined as value of economic output lost because of both long-term and short-term illness, injury-related work disability or premature death (ibid, 2002). Table 8.1 provides the DALYs by gender and the direct and indirect economic costs for some selected diseases.

As the table shows, cancer for both males and females has the highest DALY total, but cardiovascular disease exacts a greater financial toll when both direct and indirect costs are combined. Mental health disorders ranks high in the burden of disease by DALY and economic costs. Using burden of disease calculations can help in planning priorities for public intervention. It is possible to measure the benefits of intervention, whether it is to reduce mortality or to reduce the period of time lived in a disabled state.

TABLE 8.1 BURDEN OF ILLNESS BY DALYS AND IN ECONOMIC TERMS FOR SOME SELECTED DISEASES, BRITISH COLUMBIA, 1998

Disease	DALYs for Female	DALYs for Male	Direct Costs (in $Millions)	Indirect Costs (in $Millions)
Cancer	82,240	81,369	295.6	1,441.7
Cardiovascular diseases	63,355	81,118	821.2	1,375.1
Mental health disorders	44,278	43,088	558.4	598.8
Neurological and sense	36,054	32,861	372.3	831.7
Chronic respiratory diseases	24,854	26,932	416.1	776.3
Musculo-skeletal diseases	17,049	9,561	372.3	2,328.9
Digestive disorders	12,352	13,212	438.0	266.2

Direct costs are payments for treatment and care related to illness or injury, including expenditure for hospital stay, drugs and physician services. Indirect costs are the value of economic output lost because of illness, injury-related work disability, or premature death.

Sources:
(1) DALY - Strategic Policy and Research Branch, B.C. Ministry of Health Planning. (2001). Unpublished paper.
(2) Economic Burden of Illness – Data derived using charting application from Health Canada (2002), prepared by Prevention and Wellness Planning, B.C. Ministry of Health Planning. (2003). Unpublished paper.

What Do the Indicators Show?

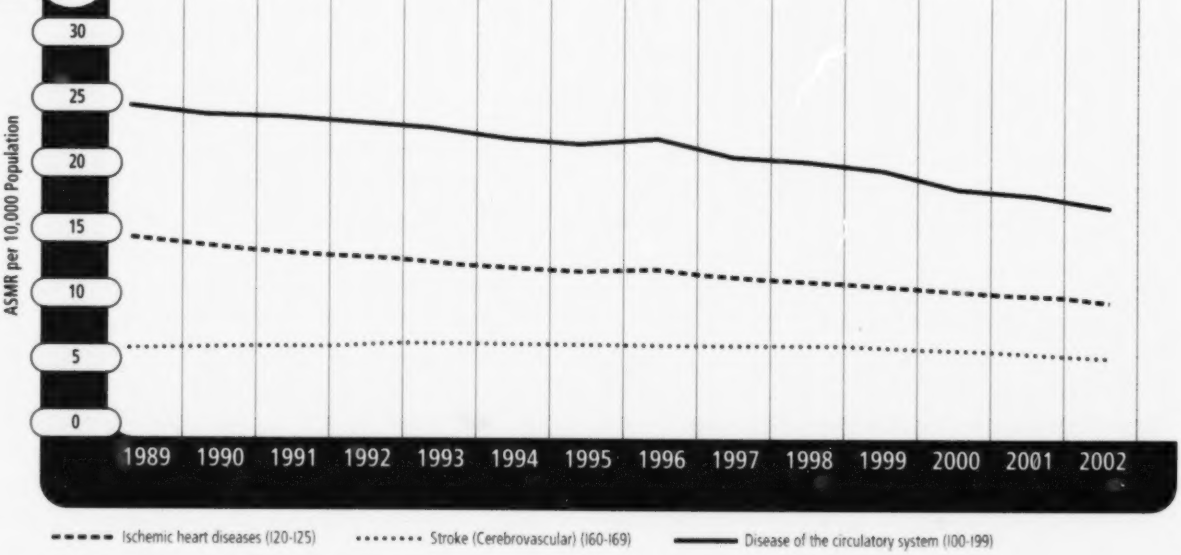
- Death rates from heart disease and stroke have been declining for the past 20 years. However, the two still rank among the leading causes of death in the province, accounting for approximately one third of all deaths each year. Proven prevention interventions include smoking cessation, healthy diet and exercise, control of high blood pressure, control of blood lipid levels and control of diabetes.
- Age standardized mortality rates for all cancers, including lung cancer, are declining in men. In women, the lung cancer mortality rate is increasing while most other cancer mortality rates are decreasing. In general, cancer incidence rates have also declined over the last decade. However, cancer deaths still account for almost 30 per cent of all deaths. Proven prevention interventions include smoking cessation, healthy diet and exercise, sun protection, and early detection.
- The rate of death from respiratory diseases has remained relatively unchanged over the last decade. Tobacco smoking and exposure to airborne particulates in air pollution are the largest preventable risk factors.
- The number of psychiatric hospital admissions per year has declined slightly over the last five years. However, the length of stay has remained unchanged at about 11 to 12 days per case. Prevention includes supportive case management and more coordinated community care.
- The number of babies born with neural tube defects has been steadily declining over the past 15 years, in part due to prenatal detection and termination of affected pregnancies and a focus on folic acid supplementation for childbearing women.

Heart Disease And Stroke Deaths

The rates of diseases of the circulatory system - the heart, the blood vessels of the heart, and the system of veins and arteries throughout the body and within the brain - have continued on a downward trend over the last 40 years for both men and women. As we noted in the 1999 Annual Report, this decline is due in part to a reduction in smoking (50 per cent of British Columbians smoked in the 1960s compared with only 20.5 per cent as reported in the CCHS 2000/01), reduced consumption of dietary fat, improved pharmaceutical control of high blood pressure, and improved medical and surgical care. Since 1989, age standardized mortality rates have dropped 70 per cent for ischemic heart diseases and 37 per cent for stroke (See Figure 8.1).

FIGURE 8.1

Heart diseases, stroke and diseases of the circulatory system, Age standardized mortality rates, B.C., 1989 to 2002



Data are based on the new ICD-10 mortality coding.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

Nevertheless, deaths resulting from heart diseases and stroke continue to account for close to 10,000 deaths per year in B.C., or about one third of all deaths. By regions, Richmond HSDA ranks lowest and Northwest HSDA ranks highest on deaths caused by heart disease and stroke.

Risk factors for heart disease and stroke include:

- Obesity
- Tobacco smoking
- High blood pressure
- High blood cholesterol
- Diabetes
- Inactivity

Many of these risk factors can be reduced by the same actions: stopping smoking, eating a healthy diet, losing excess weight, and engaging in regular physical activity. Medications to control high blood pressure, high cholesterol and diabetes can also reduce the risks.

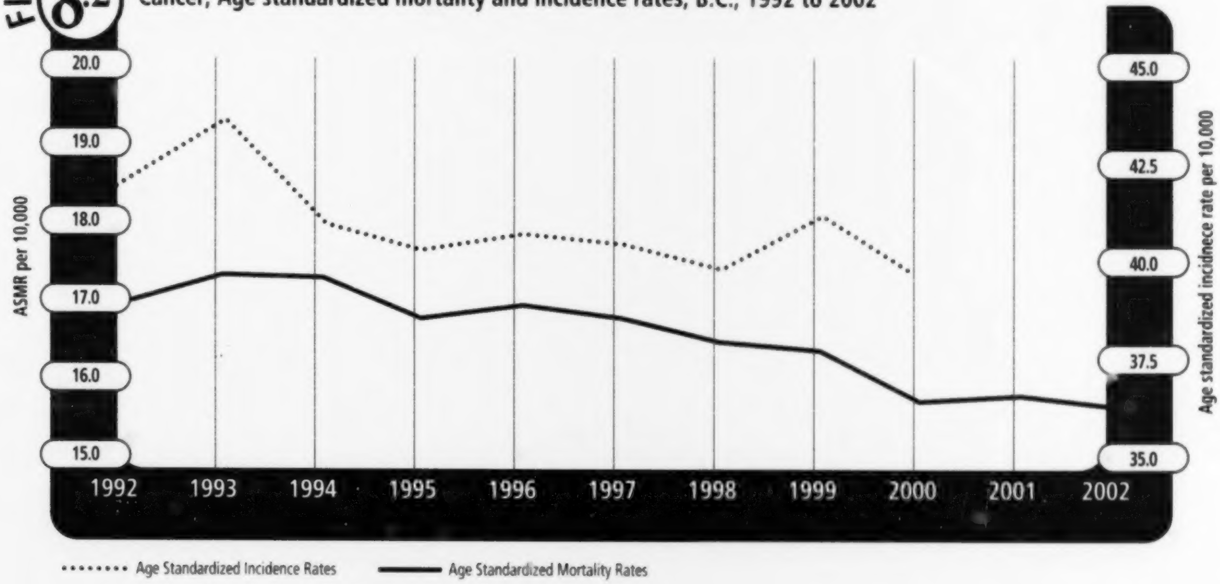
Cancer Incidence And Mortality

In 2000, there were 17,419 new cancer cases reported in British Columbia. Converted to age standardized rates, provincial incidence rates have declined from 42.2 per 10,000 population in 1992 to 39.4 in 2000 (Statistics Canada, 2001) (see Figure 8.2). Age standardized mortality rates have also decreased from 17.08 per 10,000 in 1992 to 15.7 in 2002. Although both incidence and mortality rates are declining, cancer (all types) continues to be a leading cause of death in B.C., claiming 7,940 people in 2002.

Prostate and lung cancers are the main types of cancers for new cases found in men. For women, breast and lung cancers are the main types of cancers for new cases. Figure 8.3 shows the number of deaths and new cases by gender.

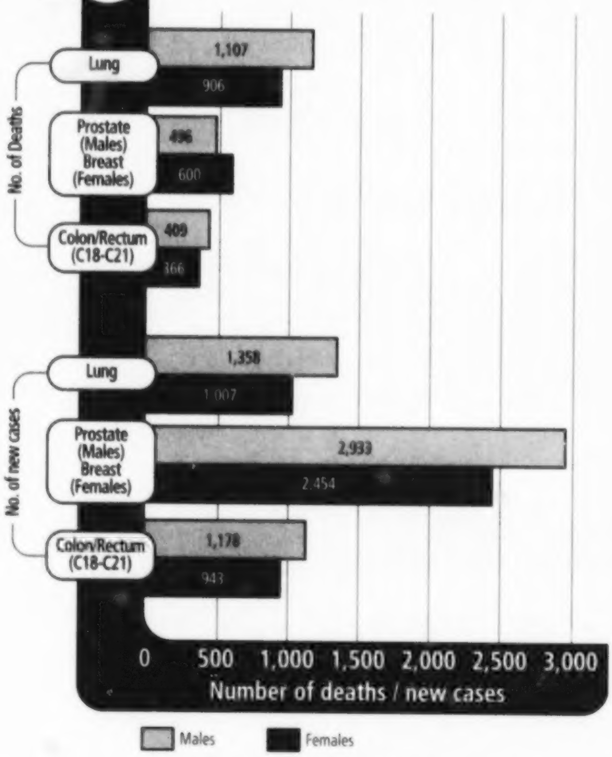
Although more men than women in this province die of lung cancer each year, age standardized mortality rates for men are slowly decreasing, from 6.6 per 10,000 population in 1986 to 5.0 in 2002. Lung cancer death rates for women, however, are increasing from 2.9 per 10,000 population in 1986 to 3.4 in 2002. Smoking continues to be the main cause of lung cancer. The five-year survival rate for lung cancer is less than 15 per cent (Canadian Cancer Society, 2003 April) and lung cancer is responsible for about one third of all premature years of life lost to cancer. Most lung cancers can be prevented by simply not smoking.

FIGURE 8.2 Cancer, Age standardized mortality and incidence rates, B.C., 1992 to 2002



Mortality data based on the new ICD-10 mortality coding.
Source: Mortality data are from B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. Incidence data are from Statistics Canada. (2001). *Canadian Registry Shelf Tables.*

FIGURE 8.3 Number of deaths (2002) and new cases (1999) for selected cancers by gender, B.C.



Mortality data are based on the new ICD-10 mortality coding.
Source: Mortality data are from B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.
Incidence data are from the Statistics Canada. (2001). *Canadian Cancer Registry Shelf Tables.*

Respiratory Disease Deaths

Death rates from respiratory disease have not changed much over the last 15 years. The age standardized mortality rate for respiratory disease was 5.3 per 10,000 population for 2002. This is only slightly lower than 1986. Rates for the intervening 14 years were usually above 6.0 per 10,000 population. While there is no major fluctuation at the provincial level for this indicator, it is important to note that some HSDAs have consistently had higher mortality rates for respiratory diseases for many years. Figure 8.4 shows the range in age standardized death rates for respiratory diseases. HSDAs in northern parts of British Columbia tended to have higher respiratory death rates. This may relate to higher rates of tobacoo smoking and exposure to airborne particulates in certain areas of the province.

MELANOMA AND NON-HODGKIN'S LYMPHOMA

According to the National Cancer Institute of Canada (NCIC) in 2003, the death rate for men from all cancers combined has declined 12 per cent since 1988. Among women, death rates from cancer have declined 13 per cent since 1988, except for lung cancer. However, examined separately, two cancers in particular are showing an increase in both incidence and mortality in both men and women: melanoma and non-Hodgkin's lymphoma (NHL). Intense sun exposure over the lifetime, especially in fair-skinned people, increases the risk of melanoma. While many of the new melanoma cases can be attributed to the propensity for sunbathing over the last 30 years, some of the increase in incidence may be due to better early detection and the heightened awareness of the need to seek medical care for a changing mole. The reasons behind the increase in incidence and mortality for non-Hodgkin's lymphoma is not well understood, but NCIC notes the increases are likely to involve both true increases and improvement in detection and classification of NHL. Due to the limited understanding of what causes this particular family of cancers, it is not possible yet to prevent it, highlighting the necessity for continued research.

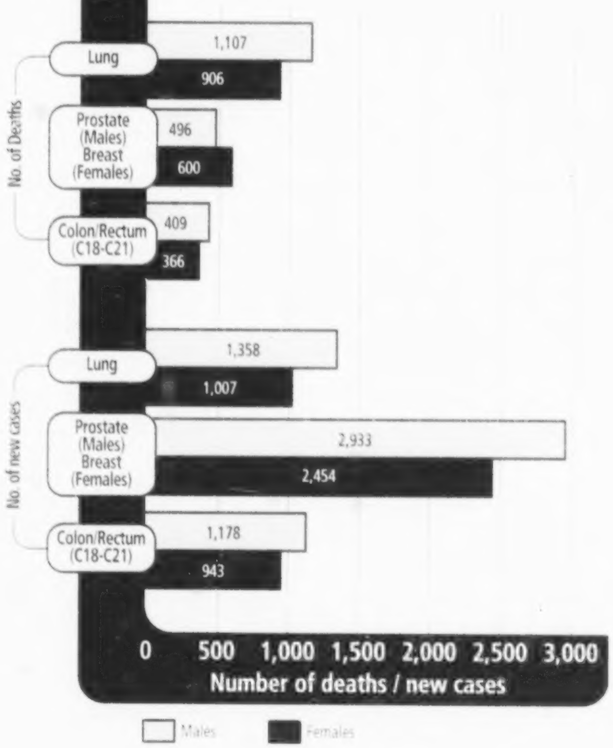
The literature clearly demonstrates the relationship between respiratory diseases and air quality. A review of epidemiology studies found that pollutants such as fine particles (PM_{10} and $PM_{2.5}$) and ozone can result in increased hospital admissions for respiratory conditions, depressed lung function among children and increased risk of lung cancer (Bates & Vedal, 2002). Goal 3 discusses air quality in more detail.

The Burden of Mental Health

According to the *World Health Report 2001*, about 450 million people world wide suffer from a mental or behavioural disorder (World Health Organization, 2001). The WHO has determined that mental illness is one of the largest contributors to disability worldwide. When the combined loss of life and disability is estimated using Disability Adjusted Life Years (DALYs), more than 10 per cent of the total burden of human disease is attributed to psychiatric disorders and substance use disorders. Of the ten leading causes of disability worldwide, five are psychiatric

FIGURE 8.3

Number of deaths (2002) and new cases (1999) for selected cancers by gender, B.C.



Mortality data are based on the new ICD-10 mortality coding.
Source: Mortality data are from B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.
Incidence data are from the Statistics Canada. (2001). *Canadian Cancer Registry Shelf Tables*.

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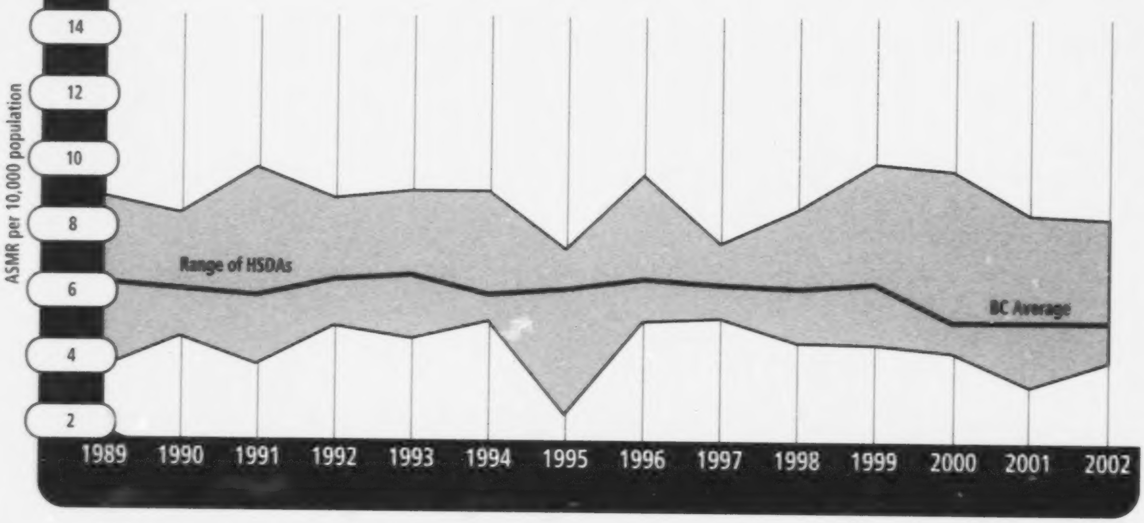
FIGURE 8.4 **Respiratory deaths, Age standardized mortality rate, B.C. Health Service Delivery Areas, 1989 to 2002**



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

disorders and substance use disorders: Major Depression; Schizophrenia; Bipolar Disorder; Alcohol Use Disorder; and Obsessive Compulsive Disorder.

Projections of future trends predict that the burden of illness caused by psychiatric disorders and substance use disorders will continue to increase due to changes in the age of the population and to social and economic factors. It is estimated that approximately 656,000 British Columbians experienced mental disorder or substance use disorder in 1999/2000 (B.C. Ministry of Health Services, 2002, unpublished report). In British Columbia, psychiatric disorders ranked third for males and females in terms of DALY (see Table 8.1).

As we discussed in Chapter 2, an analysis of B.C. mortality data from April 1997 to December 2000 has shown that those with psychiatric illness in B.C. are several times more likely than the general population to die from coronary heart disease, AIDS, stroke, chronic liver disease or cirrhosis and ill-defined medical conditions (Population Health Surveillance and Epidemiology, unpublished tables, 2001) (see Figure 2.8, page 20, for more details). Figure 8.5 illustrates differences in various age-specific and cause-specific mortality rates of a defined cohort of psychiatric patients compared to the provincial population during the same period. As we stressed in Chapter 2, this is firm evidence that more attention must be paid to the medical management of psychiatric patients to help address their excess mortality.

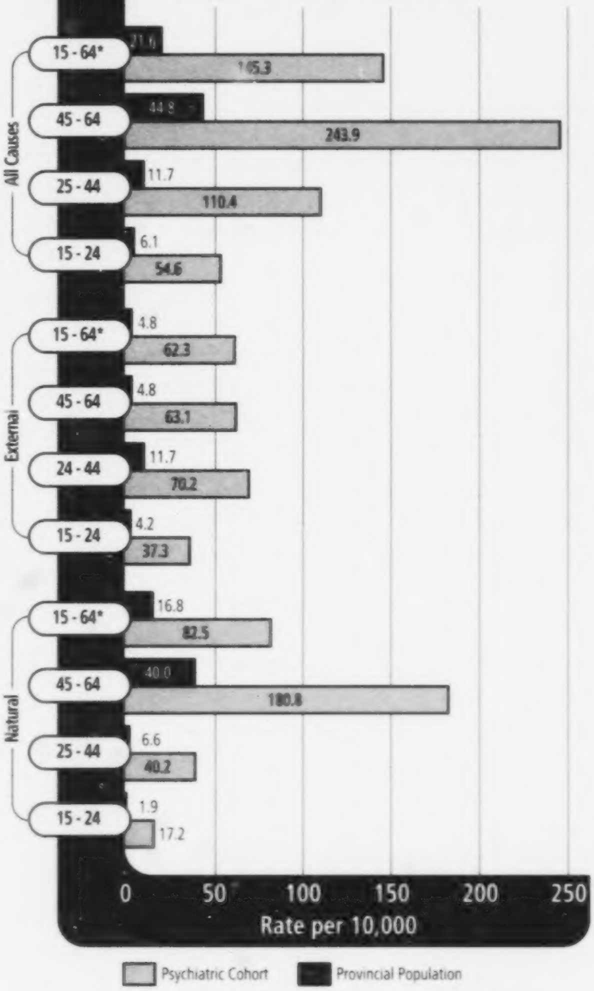
Mental Health Hospitalizations

Mental health hospital utilization is one readily available measure of a population's mental health status. In general, the number of hospitalizations has decreased but the length of stay has remained unchanged. Age standardized case rates per 1,000 population decreased slightly from 6.8 in 1997/98 to 6.6 in 2000/01. Average length of stay remained at about 11 to 12 days per case – lower than the rate in the mid-1980s. The reduced length of stay is more likely a result of moving care to the community rather an improvement in mental health status. By regions, these rates ranged from a low of 3.4 for Richmond HSDA to a high of 10.3 per 1,000 population for Northeast HSDA in 2001/02.

Best practice evidence is that individuals who have been hospitalized for mental illness need to receive follow-up care by a

FIGURE 8.5

Natural causes, external causes, and all causes, Age-specific mortality rates, Psychiatric cohort and provincial population, B.C., April 1997 to December 2000



* Age standardized. Source: Population Health Surveillance and Epidemiology, B.C. Ministry of Health Planning. Prepared using data from B.C. Vital Statistics Agency and BC STATS.

physician or a community mental health program within a month of their release from hospital. This helps their recovery and prevents readmission to hospital. As discussed in Goal 4, the proportion of these patients who received follow-up care in the last few years has remained about the same - 70 per cent of all patients. While this performance target is receiving attention by all B.C. Health Authorities in their contracts, with each of them aiming to increase follow-up to 73 per cent by 2003/2004, the goal could be set even higher. In the 1999 Annual Report, we set the target of 79 per cent of mental health patients receiving follow-up care. We feel this goal is still achievable.

In future, it could be possible to collect more data to assess our response to the mental health status of the province's population. For example, indicators that could be used include (a) the proportion of men and women with mental illness who have stable housing, adequate income and meaningful daily activities or (b) death rates from suicide and other avoidable causes among persons with mental illness.

As we noted in Chapter 2, B.C. has released the Provincial Depression Strategy, Phase One, which calls for improved awareness, early intervention, a collaborative care approach, a stepped care approach that matches needs to resources, and a chronic disease management approach, including self-management tools. In addition, the Provincial Anxiety Disorder Strategy aims to achieve four goals: improved awareness; improved access to information and service; improved appropriateness of care; and improved outcomes for people with anxiety disorders. These are steps in the right direction.

Psychiatric disorders are treatable and with appropriate care and support, people with psychiatric disorders can manage their illness better, reduce the degree of disability, and achieve their full potential. The prevention of psychiatric disorders and the promotion of positive mental health are also important challenges that need more attention.

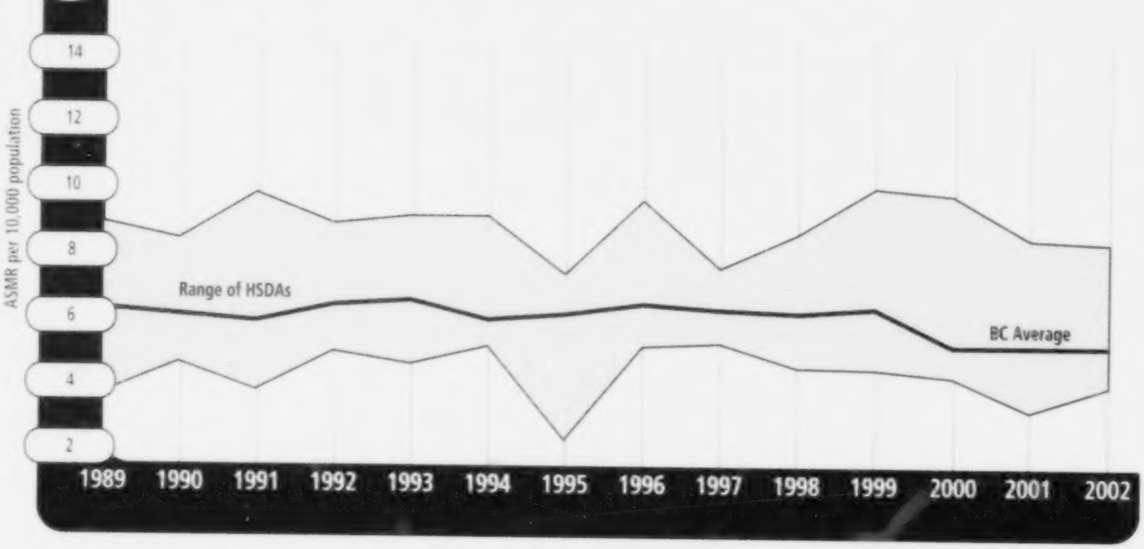
Neural Tube Defects

Neural tube defect (NTD) incidence has declined substantially over the last five years.

Neural tube defects are a group of birth defects involving the spine and brain, the most common of which is spina bifida, a lack of closure of the spine, and anencephaly, the partial or complete absence of the brain.

Neural tube defects develop in the first four weeks of pregnancy – a time when many women do not yet know they are pregnant – when rapidly proliferating embryonic cells differentiate and organize to form the neural tube, from which the brain and spinal cord arise. It is estimated that up to 50 per cent of neural tube defects could be prevented if childbearing women got enough folic acid. Women need 0.4 mg or more of folic acid daily at least one month prior to conception and throughout the first trimester, either through vitamin supplementation or through eating leafy

FIGURE 8.4 Respiratory deaths, Age standardized mortality rate, B.C. Health Service Delivery Areas, 1989 to 2002



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning

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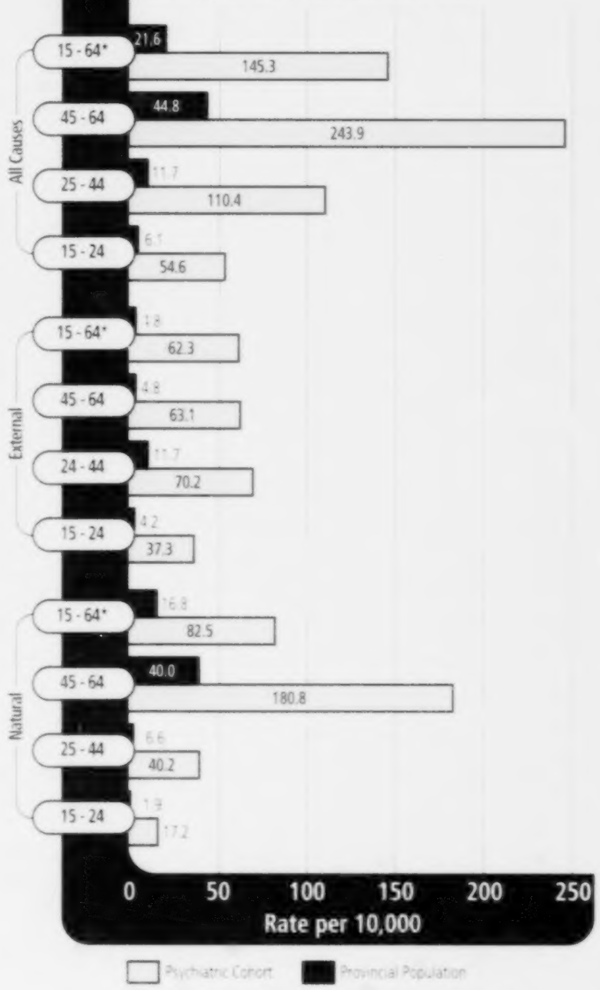

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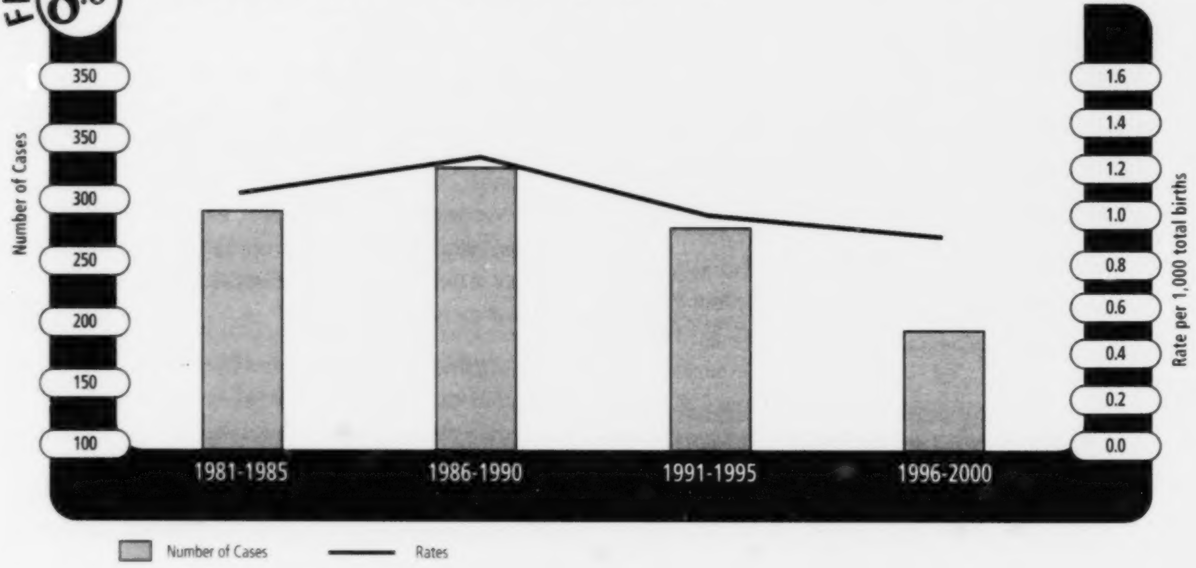
In 1994, Health Canada and other health organizations widely publicized the recommendation that childbearing women should supplement their diet with folic acid. However, the recommendation is difficult for many women to follow because it is estimated at least 40 per cent of pregnancies are unplanned and unrecognized in the crucial first weeks of embryonic development. To address this problem, in 1998, Health Canada mandated the fortification of white flour, enriched pasta and some cornmeal with folic acid, to boost the folic acid levels of everyone who consumes these products.

The Health Status Registry, managed by the B.C. Vital Statistics Agency, collects and publishes data on the number and rates of congenital anomalies and genetic defects in British Columbia (B.C. Vital Statistics Agency, 2002 September). Each year only a small number of babies are born with these anomalies, about 30 to 40 in B.C. and about 300 in Canada. We do not have the total incidence of NTDs because the number of pregnancy terminations due to the discovery of a NTD is not available. B.C.'s Health Status Registry is establishing policies and procedures to improve data collection, as recommended in the Provincial Health Officer's 1997 Annual Report.

Because of the small numbers of NTD births each year, trend data are more meaningful if presented over five-year periods. The rates of neural tube defects appear to have declined significantly from 1.35 cases per 1,000 births for the five-year period of 1986 to 1990 to 0.94 in the last five-year period between 1996 and 2000 (see Figure 8.6).

The largest decline in NTD appears to occur after the mandatory fortification of flour in 1998. It is a good example of a population-wide public health program improving the health of at risk individuals. Nevertheless, as authors of a recent Canadian study note, more population-based studies are needed to further assess the effects of fortification of flour, to determine whether fortification levels should be increased, and to rule out theoretical adverse effects, such as the masking of pernicious anemia (vitamin B12 deficiency) in older adults (Persad, 2002a).

FIGURE 8.6 Neural Tube Defects, B.C., 1981 to 2000 (in 5 year intervals)



Notes: Data includes anencephalus.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. *Health Status Registry Report 2002.*

FORTIFIED FLOUR SUCCESSES

Researchers first noted the link between low folic acid intake and neural tube defects (NTD) in 1964. This link was confirmed by a series of randomized controlled studies in the early 1990s (Wharton et al., 2001). Public education campaigns aimed at getting women to voluntarily increase folic acid intake before conception have been largely unsuccessful (Centers for Disease Control, 1999). For that reason, Australia, the United States, Chile, and Canada began mandatory fortification of flour with folic acid in the late 1990s. The move was associated with a 19 per cent reduction in NTD live births and stillbirths in the U.S. in the first two years alone (Honein et al., 2001).

Two recent studies in Canada found total incidence of NTDs (live births, stillbirths and terminated pregnancies) decreased 47 per cent in Ontario (Gucciardi et al., 2002) and 54 per cent in Nova Scotia (Persad et al., 2002) in the three years post-fortification. A similar study has not been done in B.C.

Folic acid fortification also appears to be good for adult health, too, as it has been linked to a decrease in vascular disease (blood clots and hardening of the arteries) as well as a decrease in cancer, particularly colorectal cancer (Bailey et al., 2003).

The benefits of fortification have led some public health experts to advocate for an increase in fortification from 150 µmg to 240 µmg per 100 g of flour (Oakley, 2002). However, this suggestion is controversial because the increase might lead to excessive folic acid levels in adults, in particular masking vitamin B12 deficiency in elderly adults (Wharton et al., 2001).

Where Do We Go From Here?

Setting targets for non-communicable disease indicators can be a very complicated process. Many factors, from genetics to lifestyle to government policies, can impact the mortality, incidence and/or hospitalization rates.

As we noted in the 1999 Annual Report, cancer rates can be reduced substantially by efforts to reduce smoking, improve diets, screen for breast and cervical cancer, reduce sun exposure and continue to develop and refine cancer treatments. Reducing smoking and improving diet and exercise will also greatly reduce cardiovascular disease. British Columbia has recently put an increased focus on Chronic Disease Management to improve the health outcomes and improve the coordination of their care. As part of the program, Chronic Disease Management and Prevention collaboratives have been formed with representation from experts in specific diseases and a wide range of organizations including the B.C. Medical Association, health authorities, the pharmaceutical industry, and citizen groups. These groups will not only be focusing on establishing better care for those who have chronic diseases, but also on developing health promotion and prevention programs to reduce the incidence of chronic disease. Despite progress, however, we still have a long way to go.

Reducing smoking and exposure to second-hand smoke and air pollution, as well as increasing the rates of influenza and pneumococcal immunization, are the main strategies for reducing respiratory diseases.

New provincial strategies for depression and anxiety disorders should result in improved management, treatment and coordination of mental health services for these common conditions. Health authority performance contracts will also focus attention on mental health services.

Progress in preventing neural tube defects is occurring, but continued effort is needed to inform childbearing women of the need to take adequate amounts of folic acid before conception and in the early days of pregnancy. More research is needed to clarify the optimum amount of folic acid fortification in flour to obtain adequate dietary intake for the at risk population.

What Actions Can We Take?

Individuals:

- Stay healthy by being smoke free, maintaining an exercise routine, eating well, avoiding illicit drugs and excess alcohol, and managing stress.
- Have regular preventive and screening exams, as recommended for your age, sex, and risk factors.
- Learn to distinguish between health concerns that can be safely managed at home and those, like a changing mole or blood in your stool, that need early attention from health professionals.
- Learn to recognize early signs and symptoms of mental health disorders that need attention from health professionals.
- Use resources like the B.C. HealthGuide and B.C. NurseLine to help access reliable information on self-management and on how and when to access appropriate health care resources.
- All women of childbearing age should ensure adequate nutritional intake. Women attempting to conceive or who are in the early stages of pregnancy should ensure they are getting at least 0.4 mg of folic acid per day.

Governments:

- Address socio-economic determinants of health in broad policy contexts.
- Use the "burden of disease" approach to allocate resources in health care and set priorities based on the impact of illness and disability in people's daily lives.
- Encourage health agencies to work together in addressing smoking, physical inactivity, poor diets, obesity, mental health problems, and other common risk factors for chronic and non-communicable diseases.
- Manage chronic diseases more effectively by promoting new Chronic Disease Management strategies across the health professions and among administrators and by involving affected families and individuals.
- Collect data on the total incidence (live births, stillbirths and terminations) of congenital abnormalities so that we can properly assess the true impact of folic acid fortification and evaluate whether fortification levels should increase.
- Research and develop indicators to measure quality of life for men and women with chronic disabling conditions.

Communicable Diseases

Communicable diseases are transmitted, directly or indirectly, from one individual to another. Although communicable diseases cause fewer deaths today than in the past, vaccination and infection control practices are still important prevention mechanisms. The British Columbia Centre for Disease Control (BCCDC) is the provincial agency responsible for coordinating prevention, detection and control of communicable diseases. BCCDC also tracks and publishes data related to communicable diseases.

What Do The Indicators Show?

- Over the last 10 years, vaccine-preventable diseases in B.C. have improved for all but three conditions - pertussis, pneumococcal disease and meningococcal disease. In B.C., pertussis rates have grown fastest among 10 to 14 year olds.
- The increased incidence of reported pneumococcal disease and invasive meningococcal disease is partly due to widening case definitions and increased test sensitivity. Nevertheless, the increase in both diseases in recent years has been cause for concern. A vaccination program for both diseases was instituted by the B.C. Ministry of Health Services in April 2003 and will reduce cases and help eliminate future outbreaks.
- B.C. tuberculosis rates remain slightly higher than the Canadian average, a rate unchanged over the last 10 years.
- B.C. has only 13 per cent of the Canadian population but has 20 per cent of newly reported HIV infections. After a decade of decline, overall HIV incidence is showing a small but definite (6.5 per cent) increase.
- Women accounted for 22 per cent of newly reported HIV cases between 1996 and 2001.
- Death rates from HIV have been declining due to the existence of highly effective anti-viral medication.
- Sexually transmitted diseases are still prevalent and problematic. Chlamydia and gonorrhea, after declining for almost a decade, climbed in 2000 then dipped slightly in 2001. Syphilis, once thought well under control, climbed throughout the 1990s to a high of 4.3 per 100,000 in 2001.
- Universal Hepatitis B vaccination of all Grade 6 students in B.C. is proving effective; among people age 10 to 19 years the reported rate of Hepatitis B declined from 3-4 per 100,000 to 0 per 100,000 in 2002. Serum blood tests of women 15 to 19 showed 80 per cent had protective antibodies against the virus conferred from the vaccine.
- Hepatitis C infections increased throughout the decade. An estimated 40,000 people are infected with Hepatitis C in B.C., of whom about 30 per cent do not know they are infected.
- The emergence of the SARS and West Nile viruses bring home the need to monitor the world for emerging pathogens and plan public health responses to contain and control the spread of new diseases.

Vaccine-Preventable Diseases

Vaccination prevents many thousands of illnesses in B.C. every year. A well-maintained program is necessary to ensure continued control of previously common childhood diseases to prevent outbreaks. See Table 8.2 for a summary of progress in vaccine preventable diseases in B.C.

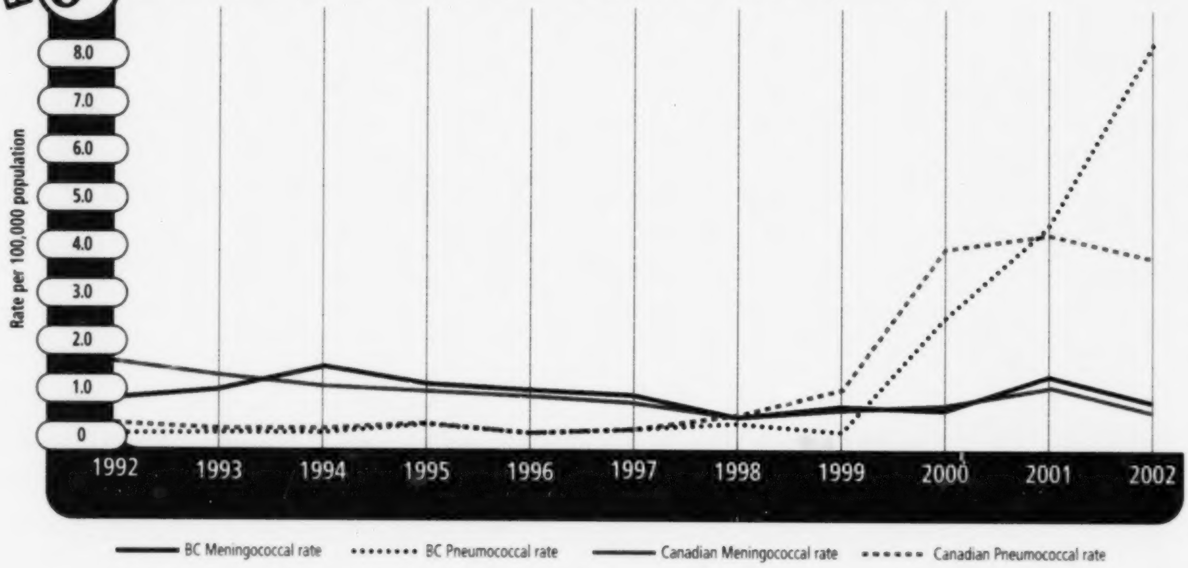
The ten-year trend from 1993 to 2002 shows that the rates of vaccine-preventable disease have improved for almost all except pertussis, pneumococcal and meningococcal diseases.

Pneumococcal and meningococcal diseases

Pneumococcal and meningococcal disease rates in B.C., although showing a worsening trend, are similar to the rest of the country (see Figure 8.7). BCCDC reported that part of the reason for the worsening trend in pneumococcal diseases is due to a broadening of the case definition. New laboratory testing techniques have increased the diagnostic sensitivity for meningococcal disease, leading to the confirmation of some infections that otherwise would formerly not have been identified.

In 2002, 32 cases of invasive meningococcal disease were reported in British Columbia, lower than the previous high of 53 cases in 2001. The disease is caused by the bacteria *Neisseria meningitidis*, also called meningococcus. At any one time, 10 to 20 per cent of people will carry the bacteria harmlessly in their nose or throat. One of every 25,000 to 50,000 persons who carry meningococcus will develop an infection of the blood (septicemia) or the brain (meningitis). Usually cases of invasive disease are single cases but outbreaks can occur, particularly among teenagers and young adults. The bacteria are spread by exposure to saliva and respiratory secretions of infected individuals.

FIGURE 8.7 Rates for Meningococcal and Pneumococcal Diseases, B.C. and Canada, 1992 to 2002



Source: B.C. Centre for Disease Control. (2003, June). Unpublished Report.

In 2001, a serious outbreak of serogroup C meningococcus occurred in the Mission/Abbotsford region. Eleven people were infected, seven of whom were between the age of 15 and 29 and two people died. Further spread of the outbreak was successfully controlled by a then newly licensed protein conjugate meningococcal C vaccine, with which about 40,000 teens and young adults were immunized (Bigham et al., 2002).

Like meningococcus, pneumococcal bacteria can be carried in the upper respiratory track of healthy individuals, and can cause ear infection, meningitis, septicemia and pneumonia, predominantly in infants and the elderly.

Early in 2003, the government announced that vaccines against both meningococcal and pneumococcal disease would be made available. Both vaccines were made available to high-risk groups in April 2003. The meningococcal vaccine became part of the universal immunization program in July 2003 and is now offered to children at 12 months of age. Pneumococcal vaccine became part of the universal immunization program in the fall of 2003 and will now be offered to all infants at 2, 4, 6, and 18 months of age. More details on these vaccines can be found in Goal 4.

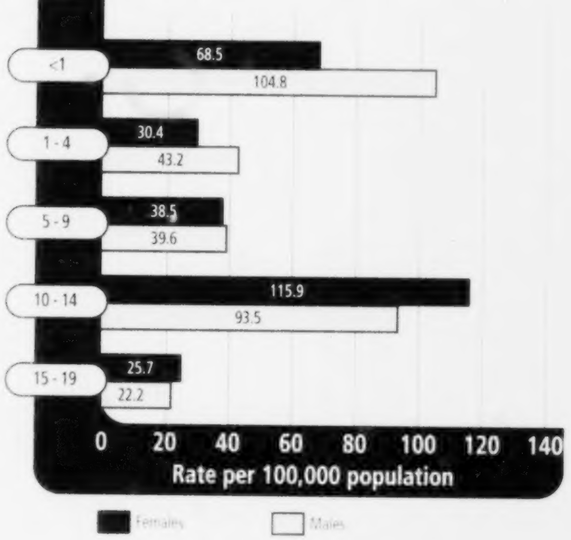
In 2001, a vaccine for varicella (chicken pox) was licensed in Canada. The National Advisory Committee on Immunization (NACI), the B.C. Communicable Disease Policy Advisory Committee and the Provincial Health Officer recommended that it, too, be made available free of charge to children in the province. The varicella vaccine, however, is not yet covered under the childhood immunization program but is available for purchase from pharmacies in British Columbia.

Pertussis

British Columbia, as well as most of North America, is experiencing an increasing trend in pertussis (whooping cough) rates, particularly among teenagers and adults. B.C.'s rate of pertussis, however, has exceeded the rate of the rest of the country. Pertussis, typically a childhood disease, can be prevented through primary vaccinations in infancy and subsequent booster doses before two years of age and at school entry.

According to BCCDC, the incidence of whooping cough was highest in 10 to 14 year olds and exceeded those in younger age groups in 2002 (see Figure 8.8). Protection from pertussis vaccination wanes with time. This has been cited as one of the possible reasons for the increasing rates in preteens and teens who would have received their vaccinations as infants

FIGURE 8.8 Whooping cough, Age 0 to 19 years, B.C., 2002



Source: B.C. Centre for Disease Control. (2003, June). Unpublished report

2000 PERTUSSIS OUTBREAK

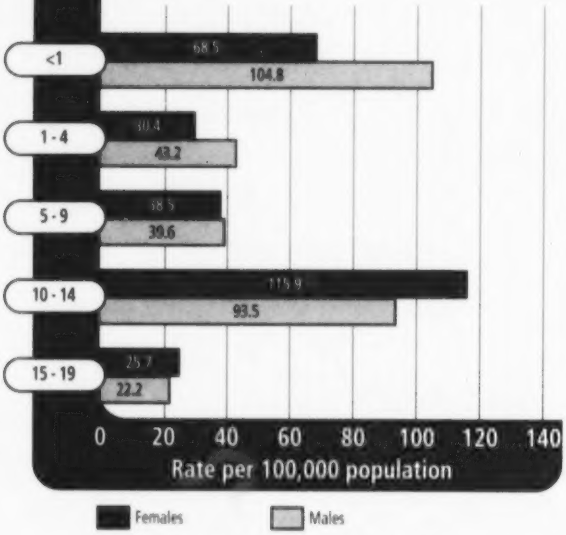
Pertussis outbreaks in Canada tend to peak every four years. Following a 1996 high of 959 cases, B.C. experienced its largest outbreak in 2000, when 1,549 pertussis cases were confirmed, many concentrated on Vancouver Island. Preteens and teens represented the largest proportion of affected individuals. For the first time, infants and preschoolers had lower incidence rates. Waning protection from the vaccine plus the possibility of a less protective vaccine in the late 1980s and early 1990s may be the cause.

Seasonality of the outbreak was also unusual. Instead of pertussis reports increasing in July and peaking in late August and September, during 2000 the reports began increasing in March and peaked in July.

Fortunately, there were no deaths and the decreasing incidence among young children suggests good protective coverage with the new acellular pertussis vaccine (Skowronski, 2002).

FIGURE 8.8

Whooping cough, Age 0 to 19 years, B.C., 2002



Source: B.C. Centre for Disease Control. (2003, June), Unpublished report.

2000 PERTUSSIS OUTBREAK

Pertussis outbreaks in Canada tend to peak every four years. Following a 1996 high of 959 cases, B.C. experienced its largest outbreak in 2000, when 1,549 pertussis cases were confirmed, many concentrated on Vancouver Island. Preteens and teens represented the largest proportion of affected individuals. For the first time, infants and preschoolers had lower incidence rates. Waning protection from the vaccine plus the possibility of a less protective vaccine in the late 1980s and early 1990s may be the cause.

Seasonality of the outbreak was also unusual. Instead of pertussis reports increasing in July and peaking in late August and September, during 2000 the reports began increasing in March and peaked in July.

Fortunately, there were no deaths and the decreasing incidence among young children suggests good protective coverage with the new acellular pertussis vaccine (Skowronski, 2002).

(Skowronski et al., 2002). It is hypothesized that a poorly protective vaccine used during the late 1980s and early 1990s may have contributed to increases among teens (ibid).

A booster pertussis vaccine for those between 12-54 years of age has recently been licensed for use in Canada. The B.C. Communicable Disease Policy Advisory Committee is reviewing whether an adolescent booster program should be implemented in British Columbia. Except for Newfoundland and Ontario, no other province has administered the booster program as a public health strategy.

TABLE 8.2 PROGRESS IN REDUCTION OR ELIMINATION OF VACCINE-PREVENTABLE DISEASES, BRITISH COLUMBIA

Disease	Goals / Targets	Current Status
Diphtheria	Eliminate indigenous cases by 1997	No cases reported 1996 – 1998. One case in 1995 and one case in 1999.
Invasive *Hemophilus Influenza* B (Hib) infections	Achieve and maintain absence of preventable cases in children by 1997	Three cases in children (ages 0 to 14) in 2002. Prior to the introduction of Hib vaccine, there were more than 100 cases of invasive Hib disease each year, and most of these were young children.
Hepatitis B	Reduce prevalence of indigenously acquired chronic infections in children and young adults by 90 per cent by 2015	No cases reported in children (age 0-14) and seven in youth (age 15-24) in 2001. Provincial information does not include how cases were acquired – indigenously (locally) or through migration or travel to an infected area.
Measles	Achieve incidence of less than 1 per 100,000 by 2000	Except in 1997 when there was an outbreak among students at Simon Fraser University, the rate has been at or below 1.0 per 100,000 since 1993. In 2002, five cases were reported and no recognized spread occurred in B.C.
	Eliminate indigenous cases by 2005	Two-dose measles schedule introduced in 1996. The goal to eliminate indigenous cases by year 2005 is attainable.
Mumps	Maintain active prevention program to minimize serious effects	Two-dose vaccine schedule introduced in 1996 together with measles and rubella. Six cases reported in 2002.
Pertussis	Reduced illness and deaths related to pertussis	Rates of illness are cyclical, but generally increasing. 79 cases reported in youth (age 15-24) in 2002. The B.C. Communicable Disease Policy Advisory Committee is reviewing whether an adolescent booster program should be implemented in British Columbia.
	Reduce intensive care admissions 50 per cent by 1997	Reduction goal may not be meaningful in B.C. since the number of intensive care admissions continues to be small, at an average of four cases per year since 1997/98.
Polio	Maintain elimination of wild indigenous cases	Achieved. Last B.C. case was reported in 1979
	Prevent future imported cases	Risk of imported cases is still present. Immunization rates must be maintained.
Rubella	Eliminate congenital rubella syndrome by 2000	Three cases of rubella reported in 2002 and one case of congenital rubella syndrome.
Tetanus	Maintain elimination of tetanus in newborns and children	No cases reported in 2002.

Sources: Health Canada. (1995, March). National goals and objectives for the control of vaccine preventable diseases of infants and children, *Canada Communicable Disease Report, Vol 21*-6, F-2 - F-5. Ottawa, ON: Health Canada. http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/95pdf/cdr2106e.pdf

B.C. Centre for Disease Control. (2003 August). Unpublished data.

Tuberculosis

As we noted in the 1999 Annual Report, after five decades of decline in B.C. and Canada, tuberculosis rates began to level off during the 1990s. Four main factors are cited as having contributed to this:

- The emergence of HIV infection and AIDS in which the depressed immune system allows either newly acquired or latent TB infections to progress into active disease.
- The continued high prevalence of the disease in many foreign countries, particularly Asia and Africa. These countries often have drug resistant strains. New immigrants to Canada brought new or latent infections.
- The continued high rates of TB among Aboriginal people.
- The emergence of drug-resistant strains which were more difficult to treat and which if unrecognized could lead to failure of treatment and further spread of infection.

Over the last four years, provincial tuberculosis rates have remained relatively unchanged but are still slightly higher than the national average. Multiple drug resistance has remained fairly steady in British Columbia. Table 8.3 shows the numbers of TB cases in B.C. each year, as well as the number of those cases that showed drug resistance.

TB is more common among males than females. Case rates over the last three decades have typically been highest among those older than 65 (attributed to higher levels of latent disease), but during the 1990s the rates among older Canadians began to fall while those among people 20 to 64 increased, accounting for about two thirds of the infections. The peak disease rates occurred between ages 30 and 50 (Long et al., 1999).

At the regional level, tuberculosis rates for Vancouver/Richmond have been persistently higher than the provincial rates (see Figure 8.9). Their rate is typically close to three times the provincial average. The higher rate in this region is most likely explained by:

- The propensity for immigrants from countries with high TB prevalence to settle in Vancouver.
- Larger numbers of high-risk individuals living in the region, such as HIV positive individuals, Aboriginal people and injection drug users.

RISK FACTORS FOR TUBERCULOSIS

- Coming from a country with high prevalence of TB
- Aboriginal background
- Homelessness
- Substance abuse
- Time spent in correctional facility
- Contact with a person who has TB
- Older age
- Travel to high prevalence country
- Health care worker or worker with high risk population

Factors associated with progression from infection to active disease

- HIV infection
- Immunosuppressive illness
- Poorly controlled diabetes
- Alcohol abuse / IV drug use
- Malnutrition
- End stage renal disease
- Long-term corticosteroid therapy
- Radiation therapy
- Pregnancy or early postpartum
- Old, healed latent but untreated TB

(Long et al., 1999.)

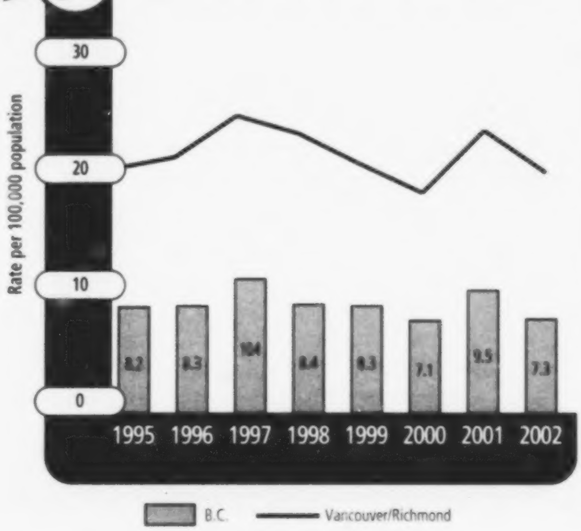
TABLE 8.3

DRUG RESISTANCE TURBERCULOSIS IN B.C. 1999 - 2002

Year	Number of Cases	Cases with Multiple Drug Resistance
1999	20	0
2000	24	3
2001	19	5
2002	19	1

Source: B.C. Centre for Disease Control, Division of Tuberculosis Control.

FIGURE 8.9 Tuberculosis rates, Vancouver/Richmond Health Region and B.C., 1995 to 2002



Source: B.C. Centre for Disease Control.

HIV INFECTION NOW REPORTABLE

As of May 1, 2003, HIV infection became a reportable disease, meaning that each new positive test will be reported to local and provincial health authorities for follow up contact tracing.

1. **The person being tested has the option of remaining anonymous.**
2. **Those who test positive and who give a list of contacts have the option of telling contacts themselves or a public health nurse will notify contacts for them. If that choice is made, partners will only be told they have been exposed to HIV and should be tested.**
3. **Confidentiality of test results is a priority, with fines of up to $200,000 for unauthorized disclosure.**

In rare cases, when physicians are concerned that HIV-infected patients are knowingly exposing others to the virus, they can discharge their ethical duty by reporting the case to the public health officer who will investigate and if necessary, notify those who are being exposed.

HIV Infection

B.C. comprises 13 per cent of the Canadian population, but accounts for approximately 20 per cent of new reported HIV infections. After a decade of decline, the overall HIV incidence rate is now showing a small but significant (6.5 per cent) increase. Since the mid-1990s, about 400 to 500 new people have tested positive for HIV and about 100 have died of AIDS each year.

In 1994, the B.C. Ministry of Health recommended testing of pregnant women, largely because antiviral therapy can prevent the transmission of the virus to the fetus. The National AIDS Committee had also put out a report in 2002 recommending that all pregnant women be counseled and tested for HIV. Now doctors in B.C. present the option of testing to all pregnant patients and the woman can decide to opt-out. In 2000, 23,408 pregnant women were tested (60 per cent). We should aim to encourage a higher uptake rate of this test by pregnant women.

Between 1996 and 2001, women accounted for 22 per cent of new cases. According to Health Canada, as many as 13,000 British Columbians could be living with HIV, and as many as one third of them are unaware of their seropositive status.

This slight resurgence of the disease is cause for concern and is one of the reasons why in 2003, HIV infection became a reportable illness. This will enable public health authorities to notify contacts of new cases to warn them they may be at risk of exposure to the infection (see box). Partner notification provides vital information to identified contacts and enhances the ability of public health professionals to contain the spread of HIV in the general population.

Rates for positive HIV reports declined from 22.7 per 100,000 population in 1992 to 10.2 in 2000 and increased to 10.7 in 2002. HIV-related deaths have also declined over the years, in part due to effectiveness of highly active anti-retroviral therapy (HAART). According to the BCCDC, the rebound of HIV in men who have sex with men and a slow but continual increase in HIV in heterosexuals are reasons for the increase in new HIV cases.

High-risk groups for HIV continue to be men who have sex with men, intravenous drug users and the Aboriginal female population. This communicable disease is a serious health issue affecting the Aboriginal communities, causing as much as seven times more deaths amongst Status Indians, than other B.C. residents (See Figure 8.10).

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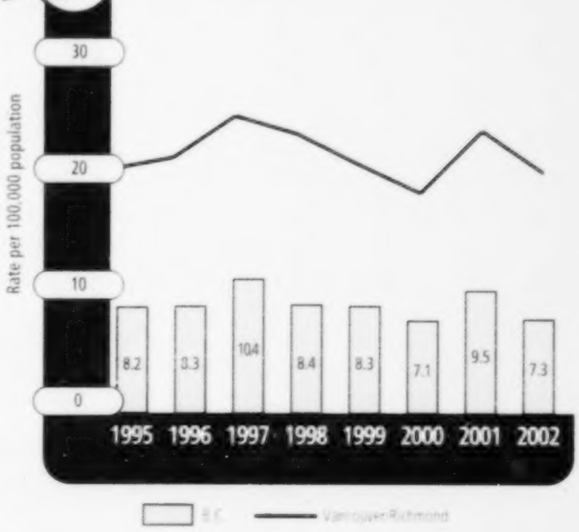

Source: B.C. Centre for Disease Control

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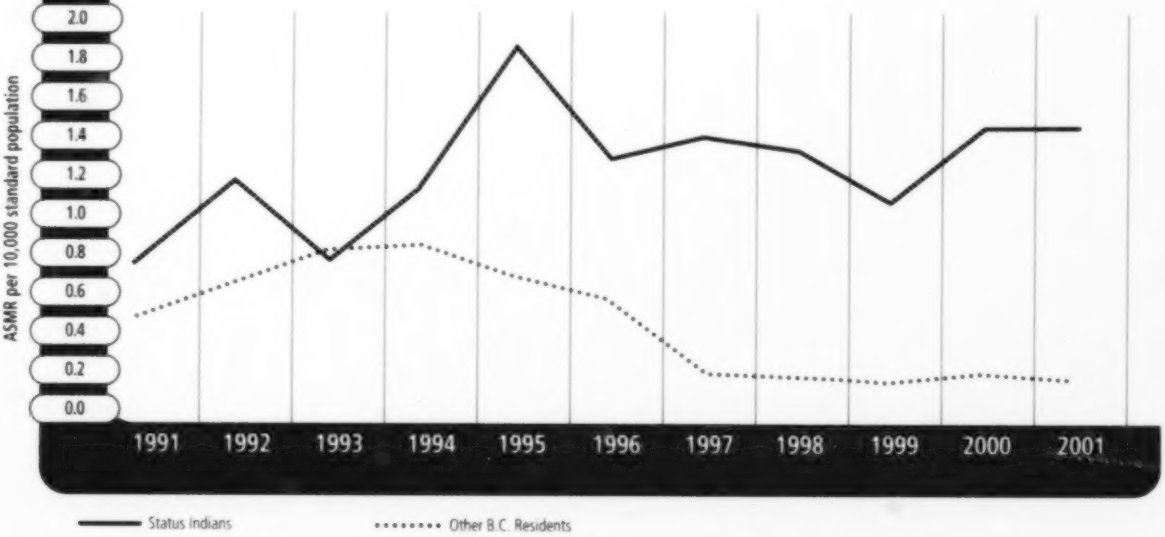
FIGURE 8.10 HIV/AIDS mortality rates, Status Indians and Other B.C. Residents, 1991 to 2001



Age standardized mortality rate per 10,000 standard population (Canada 1991 Census) for HIV disease (B20-B24).
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning, unpublished tables.

Sexually Transmitted Diseases

Sexually transmitted diseases (STDs) remain a considerable public health concern because they frequently go undiagnosed and untreated and reflect continuing unsafe sexual practices. Although men and women can be equally affected, women bear the greatest burden on their health from STD infections. Gonorrhea and chlamydia, for example, often have no symptoms in women yet if left untreated can travel up the reproductive tract inflaming the uterus, fallopian tubes, ovaries and other pelvic organs (pelvic inflammatory disease), scarring the reproductive organs and leading to ectopic pregnancies, infertility and frequent pelvic pain. Primary syphilis may also show minimal symptoms and undetected, syphilis can become latent, emerging later in life as serious heart problems, neurological problems, bone pain, skin disease and even death. Most sexually transmitted diseases can also be passed to the fetus causing health problems in the newborn infant.

During the early 1990s, the rates of both of chlamydia and gonorrhea infections were high, greater than 180 per 100,000 and 20 per 100,000 respectively. Rates declined from 1995 to 1998, but rose again in the last years of the decade. In 2002, the rate for chlamydia rose to 185.0 per 100,000, similar to the 1992 rate. For gonorrhea, the rate was 17.2 per 100,000 in 2002 (see Figure 8.11).

Syphilis, in contrast, has continued to increase throughout the decade (from 0.9 cases per 100,00 in 1992 to 4.5 per 100,000 population in 2002). The increase is in part due to a large outbreak that occurred in Vancouver in the late 1990s, mostly among sex trade workers centred in the Downtown Eastside (DTES) (see box). Rates over all for Vancouver reached a high of 12.9 per 100,000 and in the DTES reached as high as 126 per 100,000 (Rekart et al., 2003). The Vancouver based-outbreak infiltrated into surrounding communities in the Lower Mainland such as Burnaby (6.2 per 100,000 population) and North Shore (6.1 per 100,000 population) causing their rates to become higher than the provincial rate.

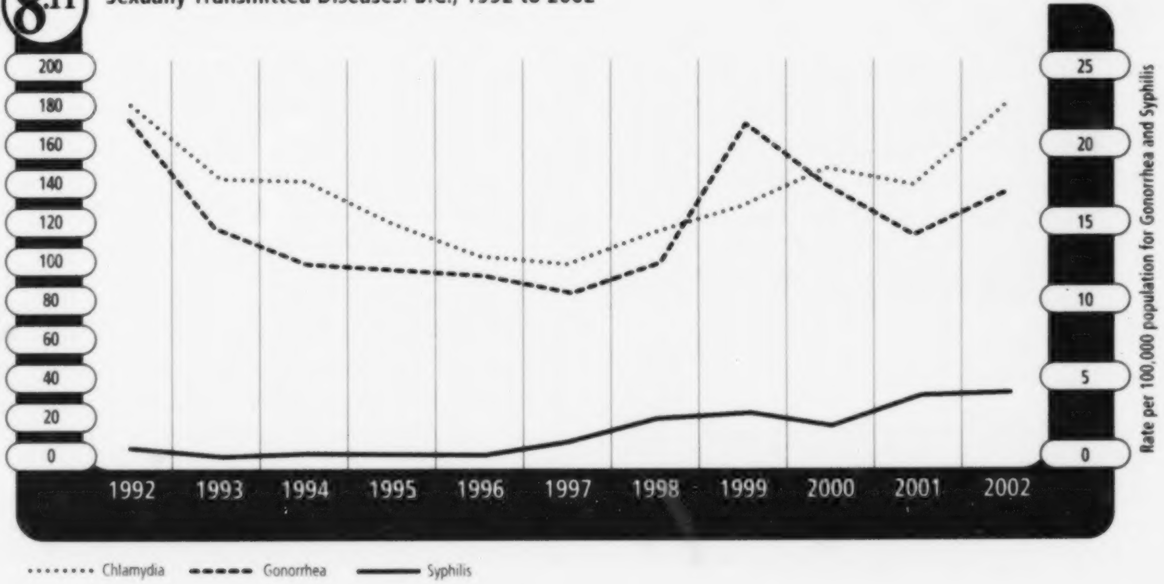
Rates of gonorrhea and chlamydia in B.C. are highest in young women age 15 to 19. Young women in this age group have also been found to be at the highest risk of infection from human papilloma virus (HPV), the causative agent for genital warts and the vast majority of cervical cancers (Sellors et al., 2003). An American study that screened more than 13,000 new female recruits into the U.S. military found that those under age 25 had the highest rates of chlamydia infection, with the highest prevalence occurring at 17 years of age (Gaydos et al., 1998). Routine screening for STD's in young sexually active women should be a standard practice in primary care.

Risk factors for higher STD rates are strongly associated with a lower age of first sexual intercourse, early age of menarche, the number of sexual partners, and lack of condom use (Health Canada, 1997 November). Recent studies of sexual behavior in Canada, England and the U.S. are showing that following a steep lowering of age of first intercourse in the late 1960s and 1970s, age at first intercourse began to climb and stabilize at around age 17 in most countries and an increasing proportion of sexually active adolescents and young adults report using a condom (Wellings et al., 2001). However, the U.S. authors noted that self-reported data about sexual behaviour may be unreliable: among the military recruits researchers screened, some subjects who reported they were virgins or who reported they always used a condom still tested positive for chlamydia.

The McCreary Adolescent Survey, which was discussed in the 1999 Annual Report, is the most recent information on sexual behaviours of B.C. youth (McCreary Centre Society, 1999). Results from the 1998/99 survey revealed that a lower proportion of teens are having sex before age 17 and higher proportion are waiting longer to have sex. However, a substantial fraction of those who are sexually active are not protecting themselves against STDs - more than half said their partners did not use a condom the last time they had intercourse. Sex with multiple partners is common among sexually active adolescents. Twenty-seven per cent of males and 20 per cent of females reported four or more partners. In the spring of 2003, the McCreary Society conducted the survey for the third time and provincial highlights of this survey will be released in December 2003.

Independent predictors of sexual health and rates of sexually transmitted diseases frequently link back to the social determinants of health. Level of education, socio-economic class, use of drugs and alcohol, family relationships and other life situation factors all affect sexual activity and risk-taking behaviors and influence the power one has to negotiate safe sex (Dhar, 2002). Targetting these underlying risk factors may have a larger impact on a wide range of health problems as opposed to simply combating their disease-based outcomes.

FIGURE 8.11 **Sexually Transmitted Diseases. B.C., 1992 to 2002**



Source: B.C. Centre for Disease control.

LARGE SYPHILIS OUTBREAK PROMPTS NOVEL MASS TREATMENT

Beginning in mid-1997 to the end of 1999, the downtown eastside of Vancouver was the center of a large syphilis outbreak, mostly among sex trade workers and their heterosexual contacts.

In an attempt to stem the outbreak, public health officials tried a novel strategy by providing oral azithromycin therapy to 4,384 at-risk residents in a two-pronged mass treatment blitz. The program included allowing "secondary" carry of the antibiotic, in which competent participants were allowed to take the treatment to otherwise inaccessible peers and sexual contacts.

Traditional methods of control were also used – screening, condom distribution, contact tracing, public education and clinical STD services.

In the first six months post treatment, syphilis rates fell significantly, appearing to show that the treatment worked. But by September of 2000, syphilis rates had rebounded, eventually reaching levels higher than 1999, showing that either the therapy had failed to reach key individuals, who were transmitting the spirochete and re-infecting the treated community, or that the effectiveness of the drug was poor (Rekart et al., 2003).

Rates have remained high through 2001 and 2002 and now Vancouver/Coastal Health Authority and the B.C. Centre for Disease Control are using social network analysis, an intense form of partner notification which attempts to find the highest risk transmitters or the key links that act as bridges from one infected individual to others, to target efforts to quell the outbreak.

Hepatitis A, B and C

Periodic outbreaks of Hepatitis A have hit British Columbia over the last decades but Hepatitis B rates are leveling off. Hepatitis C infections however, continue to increase in B.C.

Seven hepatitis viruses have now been identified (A, B, C, D, E, F, G) but it is A, B, and C that cause about 90 per cent of acute hepatitis in Canada (see Health Canada Web site www.hc-sc.gc.ca/english/diseases/hepatitis.html). All three viruses can have similar symptoms. People infected may experience effects ranging from mild, flu-like illness to severe liver damage. Acute hepatitis infection has the same typical symptoms with all three viruses - fever, appetite loss, nausea, abdominal pain and jaundice. With Hepatitis B and C, some people clear the infection and others can become carriers, passing the virus on to others while showing no outward symptoms themselves.

However, there are significant differences among the hepatitis viruses:

- **Hepatitis A:** transmitted through contaminated food and drinks and person-to-person contact, it can be prevented with hand washing and avoiding untreated water and suspected foods. A vaccine against Hepatitis A is available. In 2002, the annual number and rate of reported (acute) hepatitis continued a declining trend observed since 1996. Over this period, the rate of reported Hepatitis A decreased by 84 per cent, mirroring a similar trend across Canada. Nevertheless, over the last 10 years B.C. has consistently reported rates of Hepatitis A above the national average. In 2002, B.C.'s Hepatitis A rate was 1.9 per 100,000 while Canada's was 1.2 per 100,000. A vaccine program in place since 1998 to control outbreaks among high risk groups, particularly gay men and IV drug users, has been associated with the decline in B.C. (Scheifele et al., 2002). In 2001, the vaccine was made available free of charge to men who have sex with men and people with chronic liver disease.
- **Hepatitis B:** transmitted through sexual contact, blood and bodily fluids, it, too, is preventable by vaccine. A provincial program of Hepatitis B vaccination has been in place since 1992, targeting all Grade 6 students in the province as well as other high risk groups, such as health care workers and IV drug users (see box). A universal infant Hepatitis B program was implemented in 2001.

- **Hepatitis C:** discovered in 1989, this virus, like Hepatitis B, is passed though sexual contact, body fluids and blood. Sharing of needles and drug paraphernalia during IV drug use is believed to be responsible for almost half the cases in Canada and upwards of 70 per cent of new infections. A number of cases in Canada also occurred from blood transfusions before the adoption of adequate testing and screening of donors. There is as yet no vaccine against the Hepatitis C virus and an estimated 210,000 to 275,000 Canadians and up to 40,000 people in B.C. may be infected, about 30 per cent of whom may not know they carry the virus. Unlike Hepatitis B, most people do not spontaneously clear the virus and may remain infected for years, leading to profound fatigue, cirrhosis, and liver cancer. People with Hepatitis C should be vaccinated against Hepatitis A and B. New interferon and anti-viral treatments are helping about 30 per cent of infected individuals clear the virus.

IMPACT OF HEPATITIS B VACCINATION

In 1992, B.C. became the first Canadian province to have a universal Hepatitis B vaccination program for all Grade 6 students.

By 1999, the majority of B.C. teens aged 11 to 19 had been immunized against Hepatitis B.

To determine how well the vaccine had conferred immunity to that age group, B.C. researchers conducted a unique study - using left over blood from antenatal rubella testing in 1999, 1,215 random samples from women aged 15 to 44 years were tested for Hepatitis B antibodies. The study found:

- 79.1 per cent of the pregnant women aged 15 to 19 carried protective antibodies against Hepatitis B
- none of the women 15 to 19 showed chronic Hepatitis B infection/carrier status and just 0.06 per cent had evidence of acute Hepatitis B infection
- Among the older group of women, only 41 per cent had protective antibodies, 6.9 per cent had acute infection and 1.6 had chronic/carrier status.

The researchers concluded the universal vaccination is providing wide-spread protection from Hepatitis B to those immunized in the first seven years of the program (Dawar et al., 2003).

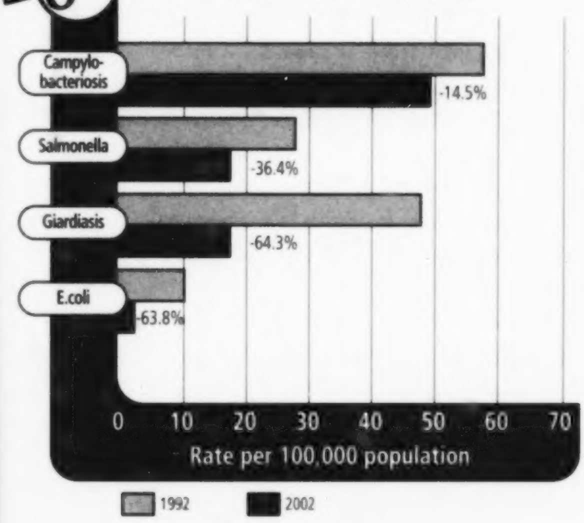
Food and waterborne diseases

Diseases can also be transmitted through water and food when safe practices are not followed. The rates for almost all food and waterborne diseases have dropped over the last decade.

Two significant outbreaks of listeriosis occurred on Vancouver Island in 2002. Both originated in small, family-run cheese factories. Caused by the bacteria *Listeria monocytogenes*, listeriosis is a potentially serious food-borne infection that can cause flu-like symptoms, with headache, muscle-aches and fever, gastro-intestinal illness and in more serious cases meningitis and septicemia and in pregnant women, miscarriage. In the spring of 2002, at least 48 people were infected after eating soft cheese which had been sprayed with a bacterial and mould culture contaminated with listeria. Five of the cases resulted in meningitis and septicemia (blood infections) two of which occurred among pregnant women who subsequently miscarried. The second outbreak in the fall of 2002 was also linked to a soft cheese in which a total of 82 cases were confirmed, two of which required hospitalization for bacterial meningitis but no pregnancy-related complications were reported. A contaminated water supply was implicated as the possible source in the second outbreak (B.C. Centre for Disease Control, 2002).

FIGURE 8.12

Food and Waterborne Diseases, Rates and per cent decrease, B.C., 1992 and 2002



Source: B.C. Centre for Disease Control

Waterborne Disease Outbreaks

Historically, B.C. has recorded one or two recognized waterborne disease outbreaks a year, but since 1999 there has been no significant documented outbreak. Nevertheless, 241 and 338 boil-water advisories were issued respectively in 2001 and 2002 respectively. As we note in Chapter 5, Goal 3, many of these boil-water advisories are on water systems that do not treat the water, and are not a confirmation that contaminants are present but rather a warning that contaminants could be present and that there is no protective barrier between the source and the consumer. For more information on regulation, management and inventory of B.C.'s water systems and quality of drinking water in British Columbia, refer to the *Provincial Health Officer's Annual Report 2000*. The major recommendations from this report have been incorporated in the *B.C. Drinking Water Amendment Protection Act*, of 2003.

Many waterborne disease outbreaks are caused by parasites like *Giardia*, *Cryptosporidum* and *Toxoplasma*, which are relatively resistant to standard disinfection agents like chlorine. These outbreaks can cause wide-spread illness ranging from mild symptoms to extreme gastrointestinal discomfort. Deaths may occur among the most vulnerable - the very young, the very old and the immuno-compromised. Many outbreaks are the result of water system failures or the absence of adequate treatment. Rates of these waterborne diseases have dropped in the last decade (see Figure 8.12). As recommended in the 2000 Annual Report focusing on water quality, if British Columbians wish to have safer drinking water, investments must be made to enhance water treatment.

Emerging Infectious Diseases

As we noted in the 1999 Annual Report, despite immunization, drug treatments, and other means of prevention and control, infectious diseases continue to emerge, or re-emerge, as public health threats. This reality has been dramatically illustrated by two recent events: the emergence in November 2002 in China of a new infectious agent, the SARS corona virus, responsible for Severe Acute Respiratory Syndrome (SARS); and the widening spread in North America of West Nile virus, which as of August 2003 had not yet been detected within B.C.'s borders.

As was noted by the PHO in an open letter to the province about SARS in April 2003, the keys to combating a new, known public health threat are neither new nor revolutionary and can be summarized in three key words: contain, control and communicate. Contain the broad transmission of a virus by focusing our efforts on geographic areas where cases are occurring; control the risk of infection at a personal level by using appropriate infection control methods; and communicate closely with other public health professionals and the public on shared approaches to prevent further spread of the disease. These strategies apply equally well to West Nile as to SARS, although the methods used to contain and control may be different.

By the summer of 2003 the SARS outbreak in Canada was declared over, with a cumulative total of 251 probable cases and 187 suspected cases (as of August 25th, 2003). Of those, only four probable cases occurred in B.C. and all have recovered. There were an additional 46 suspected cases in this province. For updates on SARS go to the Health Canada Web site:
http://www.hc-sc.gc.ca/english/protection/warnings/sars/update.html

West Nile virus is transmitted from infected birds to humans by mosquito vectors. Prevention measures include removing sources of standing water, wearing DEET-based insect repellent, and wearing long sleeves and pants. Most people who are bitten with an infected mosquito will not become ill; about one in five may have a mild flu like illness; less than one in 100 will develop serious illness. As of August 31, 2003 no cases have been reported in B.C. For updates on West Nile Activity in B.C. go to the B.C. Centre for Disease Control Web site: http://www.bccdc.org/

As we noted in the 1999 Annual Report and in a subsequent special report (Provincial Health Officer, 2000), antimicrobial resistance poses a significant and growing threat to health. Methicillin Resistant *Staphylococcus aureus* (MRSA) and Vancomycin Resistant Enterococcus (VRE) are now regular occurrences in hospitals and are a particular danger to the elderly or the very sick.

The B.C. Centre for Disease Control (BCCDC) and laboratories around the province are working to establish improved monitoring of antimicrobial resistance. In addition, BCCDC in 2001 released revised guidelines for the control of antimicrobial resistant organisms in hospitals. The Provincial Health Officer and the BCCDC continue to educate patients and physicians about appropriate antibiotic usage.

Where Do We Go From Here?

Elimination of vaccine preventable diseases remains an unaccomplished goal. In recent years, had licensed vaccines been universally accessible and available, some disease occurrences could have been prevented. These include varicella (chicken pox), meningococcal C disease and several strains of pneumococcal disease. Meningococcal and pneumococcal vaccines have been available in B.C. since April 2003.

Although an ambitious health goal for B.C., reducing the tuberculosis incidence rate to less than one case per 100,000 is theoretically achievable. It will require focusing interventions on higher risk populations. The Vancouver/Coastal Health Authority is making plans to improve TB control and surveillance among higher risk communities such as Aboriginal people and people living in poor social conditions in core areas like the Downtown Eastside.

For HIV, the number of new cases has decreased from nearly 800 cases in 1992 to a range of between 400 to 500 new cases in the last five years. Most of these new cases are reported now in the Vancouver/Coastal and the Fraser Health Authorities. The B.C. Ministry of Health Planning is reviewing and updating the province's HIV/AIDS strategy, taking into account both the changing epidemic and best evidence of "what works".

National goals for prevention and control of sexually transmitted diseases have been established since 1997 (Health Canada, 1997 November). B.C. has adopted these national goals for chlamydia, gonorrhea and syphilis. However, we have fallen short of reaching them. The national goal for chlamydia is to have a rate less than 80 per 100,000 population. In B.C., annual chlamydia rates have been over 100 cases per 100,000 in the last decade. British Columbia is also no closer to eliminating gonorrhea or maintaining syphilis rates at below 0.5 per 100,000. These are standards recommended by Health Canada. The average annual crude rates in the last decade, correspondingly for gonorrhea and syphilis, have been 14.1 and 2.0 per 100,000 population.

Setting targets for reducing foodborne and waterborne diseases is a difficult task because we lack precise data on the extent of these diseases. It is also impossible to eliminate all risks to the public but continued efforts regarding the careful management of food and water supplies will be one way to minimize the risks.

The emergence of the SARS and West Nile viruses bring home the need to monitor the world for emerging pathogens and plan public health responses to contain and control the spread of new diseases.

What Actions Can We Take?

Individuals and families:

- Make sure all family members have an immunization record and that immunizations are kept up-to-date.
- Talk with your children about sexuality and sexual health.
- Encourage school boards to provide comprehensive sexuality education.
- Follow practices that reduce the risk of sexually transmitted diseases, for example condom use, and limiting the number of partners.
- Practice good hygiene habits such as regular handwashing and safe food preparation and handling.
- Protect yourself and your family from mosquito bites.

Health system and government:

- Strengthen immunization programs by working towards implementing the recomendations from the National Advisory Committee on Immunization (NACI) and the B.C. Communicable Disease Policy Advisory Committee.
- Support a comprehensive and effective provincial public health system.
- Ensure early diagnosis, appropriate treatment and follow-up of all tuberculosis cases and contacts with special attention to high-risk groups.
- Improve the social and economic conditions that facilitate the spread of tuberculosis, such as poverty and poor housing.
- Make efforts to locate and treat all individuals who have been in contact with gonorrhea, syphilis, chlamydia and HIV infection.
- Pay attention to water systems and the food supply and minimize the risks to the public from waterborne and foodborne diseases.
- Improve the province's capabilities in monitoring and controlling antimicrobial resistance.
- Ensure the curriculum around sexual health explicitly includes education around protection from sexually transmitted infections for sexually active youth.

Injuries

In recent years it has become increasingly clear that many injuries are not random "accidents"; they are predictable, preventable occurrences that can be reduced through public health methods. There are also intentional injuries such as those resulting in suicides and homicides.

Injuries are a major public health problem in British Columbia and Canada and rank sixth among the leading causes of death in British Columbia. As the Canadian Public Health Association (CPHA) notes in a recent position paper, injuries follow predictable patterns associated with age, gender, injury mechanism, social characteristics and geography (CPHA, 2002). This is especially true for motor vehicle crashes, falls, drownings, burns or poisonings. These predictable patterns point to the potential for public health campaigns to target prevention and control measures to specific groups to reduce the toll of injuries.

What Do The Indicators Show?

- Injury mortality rates have seen a steady decline since 1999. However, each year, about 424,000 people in B.C. sustain injuries, of whom some 27,000 are hospitalized, 9,000 are partially disabled and 1,500 die. About two in five deaths of young persons below age 24 were from unintentional injuries in 2000.
- Injuries are also on a decline, with a 10 per cent reduction in hospitilization since 1999.
- Falls are the most common cause of injury for elderly people, accounting for 57 per cent of deaths due to injuries among females and 36 per cent of deaths due to injuries among males age 65 and older.
- Falls are responsible for 70 per cent of injury-related days of hospital care for elderly people and for more than 90 per cent of all hip fractures in the elderly. A single hip fracture adds $24,400 to $28,000 in direct health costs to the system. Almost half of people who sustain a hip fracture never recover full functioning and 20 per cent die within a year of a hip fracture.
- Rates for domestic violence, involving a spouse or an intimate partner, have remained relatively unchanged at 2.4 to 2.6 per 1,000 population in the last decade but translate into about 10,000 reports a year. The offender is typically male, but 13 per cent are females and one in ten involves both.
- Since the mid-1990s, more children (age 0 to 18 years) were reported abuse, neglected or harmed each year than the year before. But, this trend appears to have stabilized in recent years. In 2002, about 6,000 serious child abuse and neglect reports were confirmed by social workers. The rate per 1,000 for children (age 0 to 18 years) rose from 3.4 in 1995 to 6.3 in 2002.
- B.C.'s epidemic of illicit drug overdose, while dropping from the highs of the late 1990s, continued with 4.9 deaths per 100,000 (age 15 to 64 years) in 2002, up from 1.9 per 100,000 in 1988. Although 2002 figures are preliminary, they show a drop to 140 deaths from about 300 to 400 deaths annually in the late 1990s.
- In 2002, at least 396 people committed suicide. For unknown reasons, rates are higher in the Northwest and Thompson/Cariboo HSDAs.

Unintentional Injuries

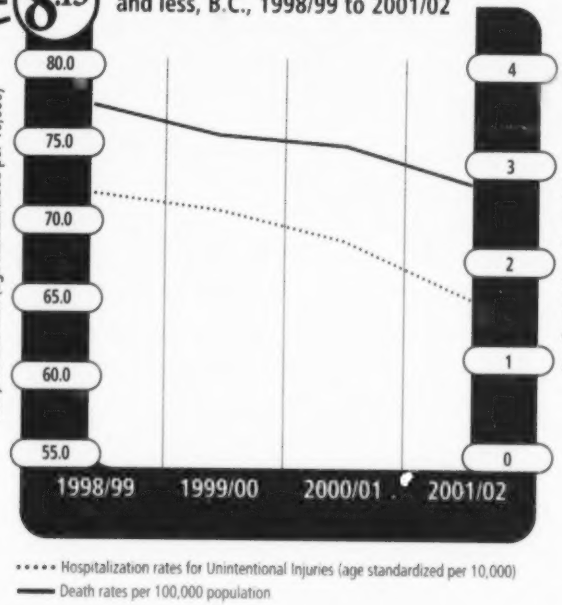
Unintentional injuries exact an enormous cost both in terms of human suffering and economic burden. Each year about 424,000 people in B.C. sustain injuries, of which some 27,000 are hospitalized, 9,000 are partially disabled and 1,500 die (Cloutier & Albert, 2001). One in five of the deaths is in a young person under age 24. The cost in terms of the total economic burden in British Columbia is an estimated $2.1 billion each year (Cloutier & Albert, 2001). As the Canadian Public Health Association notes, preventing injuries will save lives, reduce human suffering and result in substantial dollar savings to the health care system.

Unintentional injuries in the young (0 to 24 years)
Although provincial mortality rates have leveled to about 3.5 per 100,000 population (age 0 to 24 years) and hospitalization rates continue to drop, both since 1998/99 (see Figure 8.13), unintentional injuries are still a leading cause of death for those under age 24 years. Unintentional injuries include injuries caused by motor vehicle collisions, drownings, falls, and burns, with males aged 15 to 24 years old being especially vulnerable.

Falls in the elderly (65 years and over)
Falls in B.C. exceed all other causes of injury in both number of people affected and the personal and societal costs — more than motor vehicle crashes, poisonings, drowning, fires and other causes. Treating children and youth for injuries resulting from falls cost $96 million a year in B.C. (Cloutier and Albert, 2001). But, the greatest cost in both human and economic terms comes from falls among the elderly, a public health problem of huge proportions that will only intensify as our population ages.

FIGURE 8.13

Unintentional injuries, Mortality and hospitalization rates, Age 24 years and less, B.C., 1998/99 to 2001/02



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning and Information Support, B.C. Ministry of Health Services. Data for hospitalization are prepared using Discharge Abstract Database. Mortality data are by calendar years 1999 to 2002.

It is estimated that one in three people over the age of 65 will fall at least once each year. In B.C. this means that an estimated 147,000 British Columbians over age 65 are likely to fall this year. Almost half of those who fall experience a minor injury and between 5 to 25 per cent sustain a serious injury, such as a fracture or a sprain. In 2001 alone, 771 people over the age of 65 died from falls in B.C. and more than 10,000 were hospitalized.

This translated into average annual (1987 to 1998) mortality rate from falls of 14.9 per 100,000 for males and 7.8 per 100,000 for females aged between 65 to 74 years old. These rates increase substantially to 181.7 and 168.8 per 100,000, respectively for both males and females over 80 years old (Soubhi et al., 2001). The Provincial Health Officer will be releasing a special report on the *Prevention of Falls among the Elderly* (see box).

Falls among seniors - even if they do not cause injury - can create a lingering fear of falling again. The aftermath of pain or fear from a fall can lead seniors to restrict their activities which in turn can increase the risk of falling because of increased muscle weakness, stiffness or loss of coordination or balance.

Hip Fractures

Falls cause more than 90 per cent of all hip fractures in the elderly and 20 per cent of seniors die within a year of a hip fracture. A single hip fracture adds $24,400 to $28,000 in direct health costs to the system (Cloutier & Albert, 2001). Almost half of people who sustain a hip fracture never recover full functioning. Hip fractures are more common among women, partly because women tend to live to older ages and have higher rates of osteoporosis, a condition which results in bones becoming thin and brittle.

In 2001/02, there were 4,464 hip fracture hospitalizations among the elderly or about 12 per day around the province. By region, the highest hospitalization rate is found in the Northeast (15.9 days per 1,000), more than twice the lowest rate found in South Fraser (6.7 days per 1,000). Figure 8.14 shows range in values and the B.C. average for this indicator.

New epidemiological findings from an analysis of hospital separations, mortality and morbidity data in B.C. to be presented in the 2003 PHO special report on falls and the elderly found the average length of hospital stay for people who had a fall has declined significantly over the last decade. At the beginning of the 1990s, those who had fallen had average hospital stays of 13 days for those under 75, and 21 days for those 85 and older. By 2001, this had dropped to 9 days for those 65 to 74 years, 12.5 days for

SPECIAL REPORT ON FALLS AND THE ELDERLY

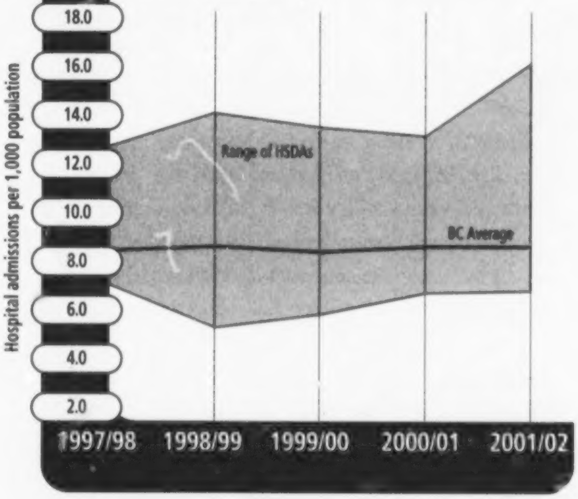
A new report from the Office of the Provincial Health Officer, focusing on the significant morbidity, mortality, economic and emotional burden of falls among the elderly in B.C., is scheduled to be released in early 2004. Evidence shows falls can be prevented by careful assessment of elderly individuals followed by targeted interventions such as management of medical problems, adjustment of medications, removal of hazards in the living environment, use of hip protectors and enrolment in strength and balance exercises.

The report makes a number of recommendations for actions by individuals, seniors' groups, health providers, regional health authorities and the provincial government to help reduce the toll exacted by falls on our elderly population.

Full text of the report will be available on the PHO Web site: http://www.healthplanning.gov.bc.ca/pho/

FIGURE 8.14

Hip Fractures, Age 65 years and over, B.C. Health Service Delivery Areas, 1997/98 to 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using Discharge Abstract Database.

those 75 to 85 years and 14 days for those 85 and older. Nevertheless, the length of stay is more than twice as long in each age group for falls than for all causes of hospitalization for people over the age of 65.

Domestic Violence

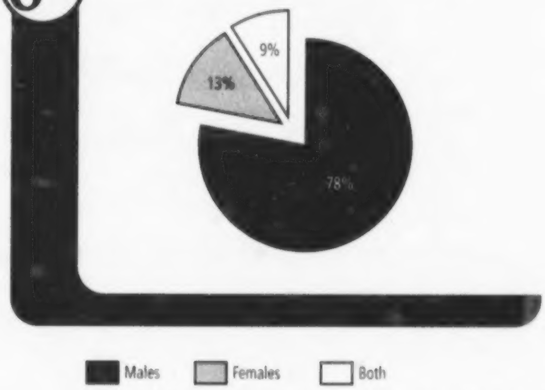
On the average, there are about 10,000 assaults by intimate partners reported to the police each year but this number likely underestimates the true prevalence and incidence of domestic assault in our society. Trends in reported domestic assault rates have remained relatively unchanged at 2.4 to 2.6 per 1,000 population in the last decade. For reported assaults the offender is typically male, 13 per cent of offenders are females and one in ten involves both partners (see Figure 8.15). Alcohol has been reported to be a factor in more than half of these assaults (B.C. Ministry of Public Safety and Solicitor General, 2001).

The Canadian Center for Justice Statistics (2002) reported that spousal violence rates are similar for men and women, but women are more likely to experience more severe forms of violence. Nationally, about seven per cent of seniors report some form of abuse (violence, intimidation, financial or emotional abuse) by both spouses, children or caregivers.

Health problems of victims of domestic violence are not just related to traumatic injury. Battered women seek help from health services for a wide range of health issues - depression, anxiety, post-traumatic stress disorder, insomnia, eating disorders, gastrointestinal upset, chest pain, substance abuse, sexually transmitted diseases and chronic pain (Eisenstat & Bancroft, 1999, Campbell, 2002). Numerous studies have found that abused women have poorer physical and mental health, have more injuries, visit doctors and emergencies more often, fill more prescriptions, have more dental problems and are admitted to hospital more frequently (Campbell, 2002). In fact, battered women show up much more frequently and much earlier to the medical profession than to the justice system or social services. These frequent contacts with health services present ideal opportunities for health professionals to identify the root of the problem and to refer women to appropriate protective services to stop the cycle of abuse.

FIGURE 8.15

Domestic violence offender, B.C., 2001



Source: Police Services Division, B.C. Ministry of Public Safety and Solicitor General.

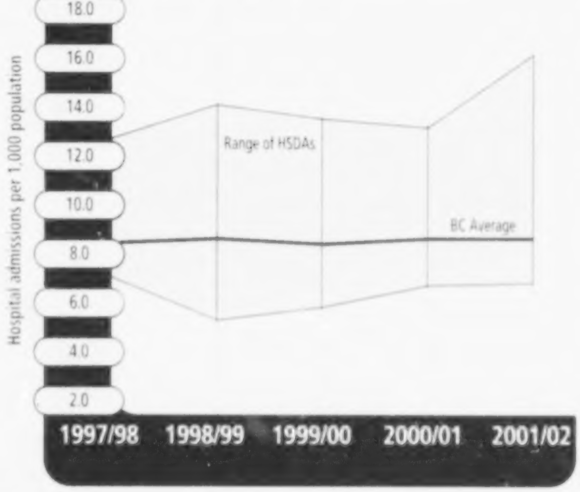
Child Abuse And Neglect

Families where domestic assault is occurring are also at risk for child abuse and neglect (Eisenstat & Bancroft, 1999).

From 1995 to 2000, more children (age 0 to 18 years) were reported abused, neglected or harmed each year than the year before. This trend appears to have stabilized in recent years and there are signs that it has begun to decline. In 2002, about 6,000 serious child abuse and neglect reports were confirmed by social workers. The rate per 1,000 for children (age 0 to 18 years) rose from 3.4 in 1995 to 6.3 in 2002 (see Figure 8.16).

FIGURE 8.14

Hip Fractures, Age 65 years and over, B.C. Health Service Delivery Areas, 1997/98 to 2001/02



Source: Information Support, B.C. Ministry of Health Services. Prepared using Discharge Abstract Database.

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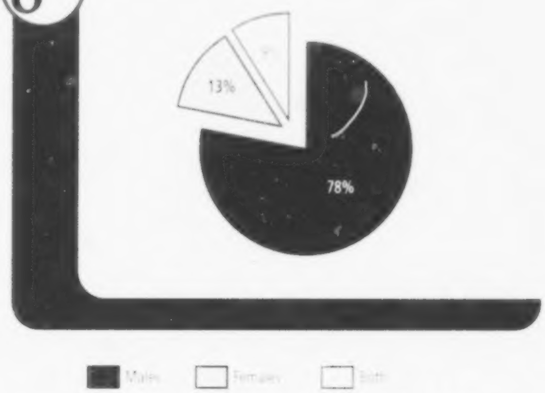

Source: Police Services Division, B.C. Ministry of Public Safety and Solicitor General.

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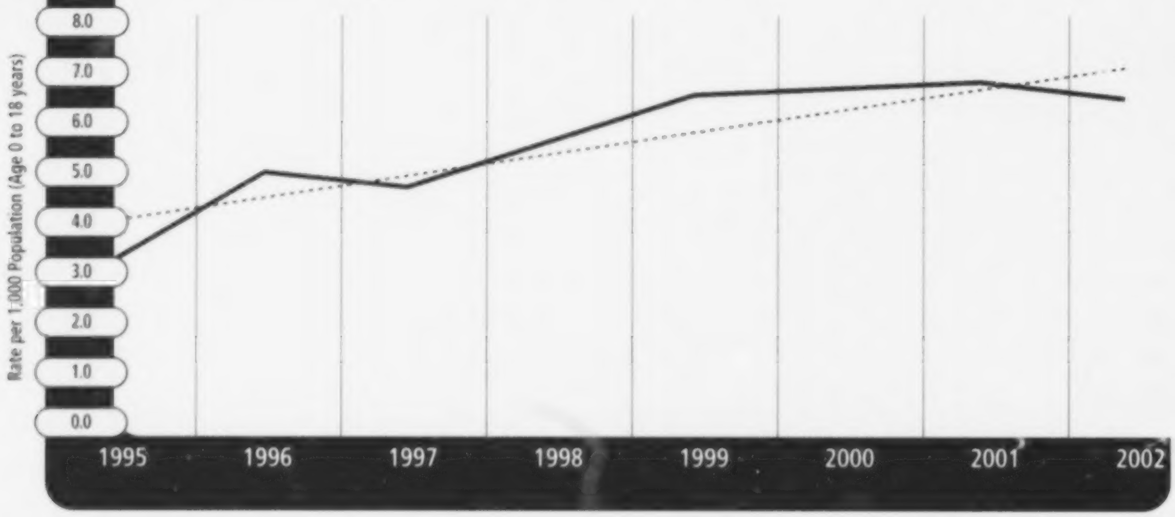
FIGURE 8.16 Child abuse and neglect, Age 0 to 18 years, B.C., 1995 to 2002



Source: B.C. Ministry of Children and Family Development.

Domestic abuse and child abuses are preventable. Factors such as poverty, substance abuse, dysfunctional relationships and family history play major contributing roles. Battering is a set of learned, controlling behaviors. Children of dysfunctional relationships may in turn become adults with ineffective interpersonal and coping skills. In turn, the lack of these skills may lead to a higher tendency for inflicting violence on themselves, their spouse or children to solve problems.

Victims of domestic violence often have frequent exposure to health and education professionals before justice and social service professionals become involved. Children may have frequent injuries, stomach aches and chronic somatic disorders, bedwetting, stress and behavior problems, problems in school, aggressive behaviors and sleep disorders (Eisenstat & Bancroft, 1999). These symptoms should alert primary care physicians, emergency room personnel or school professionals to the possibility of abuse.

Illicit Drug Overdose

British Columbia's epidemic of illicit drug overdose deaths continues. The mortality rate of 4.9 per 100,000 population (age 15 to 64 years) in 2002 is lower than two years ago but still more than double the 1988 rate of 1.9 per 100,000 (B.C. Coroners Service, 2003, unpublished data). The lower rate in 2002 may be an artifact of delays in coroner's investigations.

Recent declines in Vancouver may be attributable to increased methadone maintenance, better harm reduction education and enhanced peer outreach. Vancouver has also launched a scientifically-evaluated pilot supervised injection site late in September 2003. (See box.)

The British Columbia Coroners Service states that about two-thirds of all drug overdose deaths occur in the Lower Mainland, 80 per cent are males, and 40 per cent are between 31 to 40 years of age. Data also showed that mortality rates resulting from illicit drug use for the Status Indian population are about three times higher than other B.C. residents (B.C. Vital Statistics Agency, 2002 September).

Suicide

While other categories listed here are unintentional injuries, suicide is a deliberate act that brings harm to an individual, and his or her loved ones and friends. Suicide is a complex phenomenon that has many causes and underlying factors, the most common of which are depression and feelings of hopelessness. Globally, the risk factors for suicide are remarkably consistent and include a history of mental illness, depression or bi-polar disorder, poverty, alcohol abuse, family member who committed suicide, terminal illness or chronic pain and access to a means of suicide. Suicides are more prevalent among Aboriginal teenagers or disenfranchised males and elderly white males (Maris, 2002).

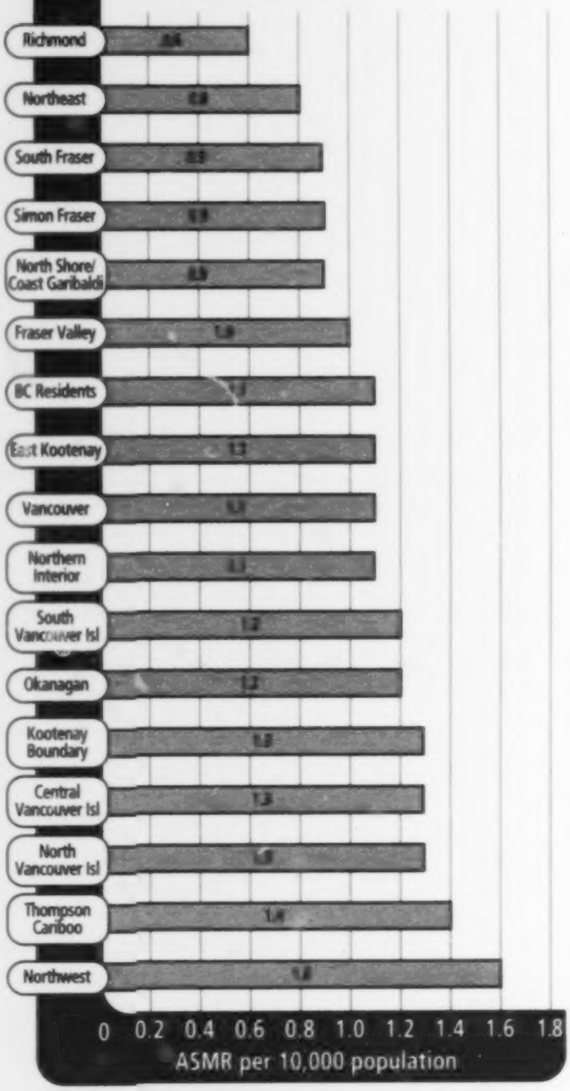
Overall, suicide rates are decreasing in B.C. In 2002, there were 396 deaths classified as suicides in British Columbia. This number may be incomplete as there are possibly "pending" coroner reports that would conclude suicide as the cause of death. However, the statistic to date still translates into slightly more than one suicide a day in the province. Women attempt suicide more frequently then men and experience higher rates of depression, but suicide mortality rates are 3.4 times higher for males than females and 2.5 times higher for Aboriginals than non-Aboriginals. Elderly men, age 75 and older also have higher rate of suicide than the general populations, about 3.0 per 10,000 in Canada compared to the general population rate of 1.23 per 10,000 (Weir, 2001).

Some regions in recent years have also experienced higher suicide rates than the provincial average (see Figure 8.17). More investigation is required to determine the reasons for a regional difference.

Suicide rates can be reduced or prevented with public health strategies. Both the World Health Organization and the United Nations have recommended that all their member states should develop suicide-prevention programs linked to public health policies (WHO, 1990; UN, 1996). These strategies include setting suicide reduction as a target; improving prevention, detection, and treatment of depression particularly in primary care; improving access to mental health services and improving data collection to better understand the full dimensions of suicide (Jenkins, 2002).

FIGURE 8.17

Age Standardized mortality rates for suicide, B.C. Health Service Delivery Areas, 5-year Annual, 1998 to 2002



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

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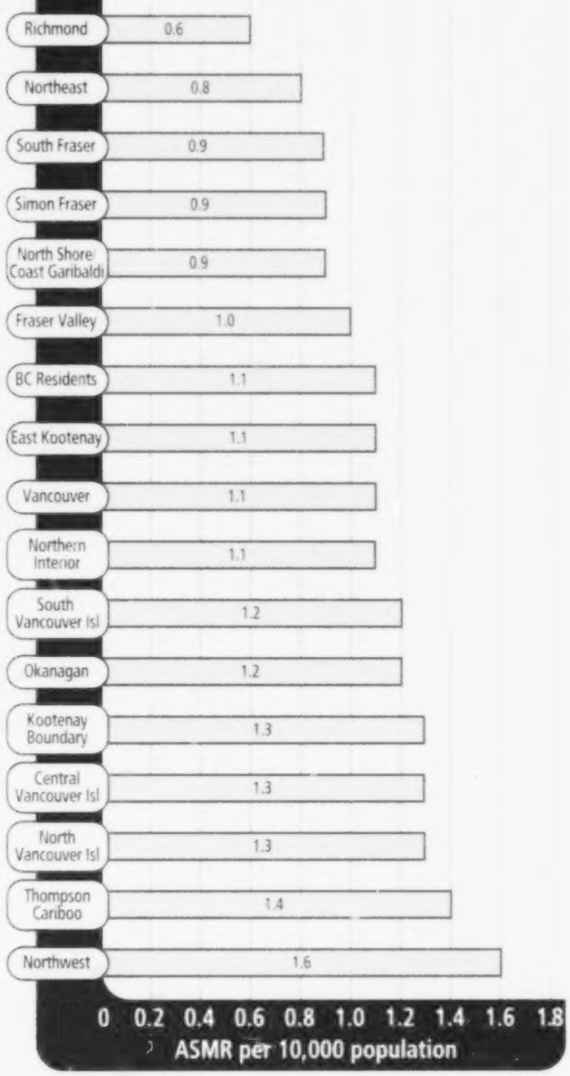


Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

SUPERVISED INJECTION SITE FOR VANCOUVER

Vancouver is the first North American city to operate a supervised injection site (SIS) for IV drug users. An application for an exemption under the controlled *Drugs and Substance Abuse Act* was submitted to Health Canada in early 2003. In June 2003, federal government gave approval for the plan. Since late September 2003, open 18-hours a day, the SIS provides the following services:

- Supervision of injections with emergency response to drug overdose
- Wound care and first aid
- Harm reduction teaching and counseling
- Needle exchange and condoms
- Referral to primary health care services.

The federal government will provide $1.5 million over four years to evaluate the project.

See: http://www.vch.ca/sis/ for more information

Where Do We Go From Here?

Understanding the circumstances that precipitate unintentional injuries can assist prevention. Both the provincial and federal governments have invested resources to develop ways to prevent injuries. In British Columbia, the provincial government has given the B.C. Injury Research and Prevention Unit (BCIRP) the responsibility to conduct and disseminate relevant and timely multidisciplinary, evidence-based injury research and facilitate the collaboration of various provincial injury prevention efforts. BCIRP, with the support of Health Canada, is also implementing a pilot data surveillance project called the Emergency Department Injury Surveillance System (EDISS). This system collects, analyses and interprets injury information of ten Emergency Departments across the province. Information from EDISS can be used to plan and evaluate community injury prevention programs.

Rates of unintentional injuries are gradually improving and hospitalizations due to hip fractures are stable. While we need to maintain our efforts in continuing to improve these trends, we can conclude that short-term targets are met.

The problems of illicit drug use, suicide, child and spousal abuse are harder to tackle. These are closely related to wider societal problems. Suicide rates are often used as a measure of a population's mental health. Similarly, rates of child and spousal abuse may be viewed as barometers of violence experienced by a society.

Domestic abuse rates have remained stable and child abuse rates can be improved. A few regions performing poorly on these indicators have likely influenced the overall provincial rates. We need to focus efforts on these regions when determining causes and finding long-term solutions.

What Actions Can We Take?

Individuals:

- Practice safe behaviours at home, at work and at play. Use seat belts, infant car seats, bicycle helmets and other safety equipment properly.
- Recognize the early signs of violence, child or domestic abuse, abuse in later life, mental illness and suicide contemplation and seek professional help. Recognize that violence and abuse are not private family matters and that they are against the law.
- Follow safe drinking guidelines and get help for substance abuse to reduce both intentional and unintentional injuries.

Governments:

- Work on strategies identified in the provincial injury prevention plan for children and youth.
- Develop injury prevention plans at the community level and encourage private and public organizations' involvement in injury prevention initiatives.
- Support effective strategies to reduce falls in community and institutional settings, balancing prevention and safety with independence.
- Develop a comprehensive and universally accessible plan for addiction services, reducing harms caused by substance abuse, and managing concurrent problems such as mental illness.
- Continue the development of coordinated response to health and social problems faced by illicit drug users, including increasing access to treatment.
- Develop and evaluate new initiatives like heroin maintenance for treatment of refractory users and supervised injection sites for areas where blood borne infections and frequent overdose deaths occur.
- Focus on the underlying factors that lead to suicide and violence, such as poverty, unemployment, feelings of alienation, substance abuse and untreated mental illness.
- Create public support for zero tolerance for violence and abuse in its many forms, such as domestic violence, child abuse, elder abuse, bullying, harassment and emotional and financial abuse of vulnerable people under the care of others.
- Monitor alcohol use and its related adverse effects.

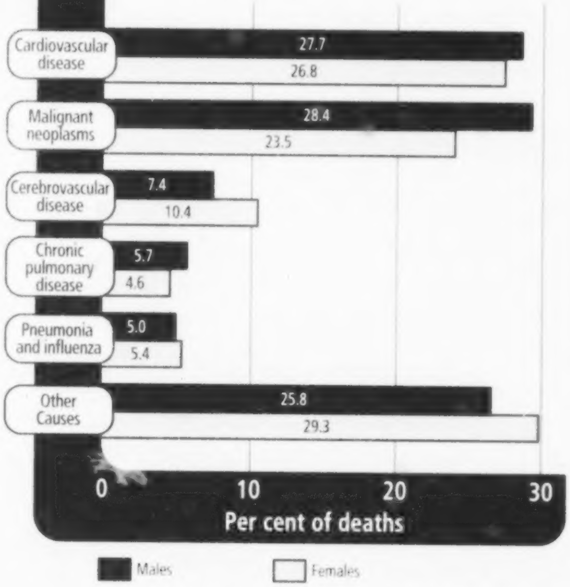
FOCUSING ON PREVENTIVE HEALTH FOR SENIORS

How do B.C. seniors rate against the Goal 6 indicators? Although many of the data about seniors has been presented already in the text, below is a summary of some findings for younger and older seniors towards the reduction of preventable illness, disabilities, and premature death.

Non-communicable disease

- Cancer, cardiovascular, cerebrovascular, chronic pulmonary diseases are the leading non-communicable causes of death for both male and female seniors – accounting for almost three-quarter of deaths amongst them (see Figure 8.18).
- Many B.C. seniors live a substantial number of years with some form of disability, usually from chronic illness. Elderly men live an average 10.1 years with disability before death and elderly women live 12.8 years with disability before death (Statistics Canada, 1996).

FIGURE 8.18 **Leading causes of death, Age 65 years and over, B.C., 2002**



Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

Communicable disease

- The types of communicable disease more common among persons 60 years and over were (a) tuberculosis – 132 cases, (b) hepatitis C – 272 cases, (c) pneumococcal (invasive) – 52 cases and (d) *Methicillin Resistant Staphylococcus aureus*, also known as MRSA – 698 cases (B.C. Centre for Disease Control, 2002). Influenza and pneumonia, a communicable disease that can affect the elderly quite severely, took 1,179 lives in 2002.
- The elderly are often in weakened conditions and more likely to be hospitalized or die from infectious disease or food or waterborne illness. The higher proportion of seniors who died during Canada's SARS outbreak is an example of their heightened vulnerability.
- Food and waterborne diseases also caused 943 and 1,702 younger and older B.C. seniors respectively, to be hospitalized (five-year period - 1997/98 to 2001/02).

Injury

- Each year, an estimated one in three seniors, or about 147,000 British Columbians, will have a fall, almost half of whom will sustain a minor injury and 5 to 25 per cent of whom will sustain a major injury.

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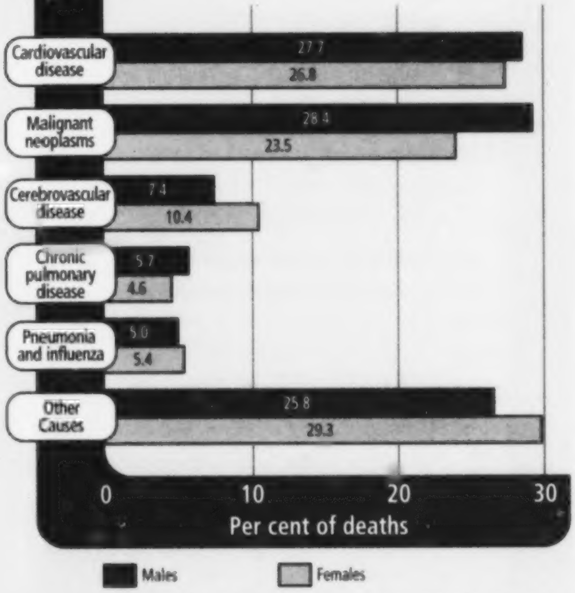

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Injury

- Each year, an estimated one in three seniors, or about 147,000 British Columbians, will have a fall, almost half of whom will sustain a minor injury and 5 to 25 per cent of whom will sustain a major injury.

FOCUSING ON PREVENTIVE HEALTH FOR SENIORS (CONTINUED)

- Falls are responsible for 70 per cent of injury-related days of hospital care for elderly people and for more than 90 per cent of all hip fractures in the elderly. A single hip fracture adds $24,400 to $28,000 in direct health costs to the system. Almost half of people who sustain a hip fracture never recover full functioning and 20 per cent die within a year of a hip fracture.
- According to national data from the 1999 General Social Survey on Victimization, 7 per cent of seniors reported that they had experienced some form of emotional or financial abuse by an adult child, caregiver or spouse *(Family Violence in Canada: A Statistical Profile 2002)*. Results from the same survey indicate that emotional and financial abuse against older adults cuts across all socio-demographic lines.
- Each year, about 70 to 80 deaths are a result of suicide for those 65 years and over in British Columbia. Suicide rates are dramatically different between males and females, even for seniors. 1996 data from the *Portrait of Seniors in Canada* (1999), reported that among seniors, men are much more likely than women to commit suicide. Among males, older seniors are more likely than younger seniors to commit suicide. There were 3.7 suicides for every 10,000 males, aged 85 and over. This is higher than the 2.7 per 10,000 for men aged 75 to 84 and 2.4 per 10,000 men aged 65 to 74.

As many as 85 per cent of B.C. seniors have reported in the Canadian Community Health Survey 2000/01 that they have at least one chronic condition such as asthma, arthritis, high blood pressure, diabetes, heart disease and cancer. Twenty-seven per cent also reported that that they have at least four or more chronic conditions. Better management of chronic diseases has been identified as a priority by the B.C. Ministries of Health Planning and Health Services and the Health Authorities. These efforts will not only increase life expectancy, they will also increase disability-free life expectancy, resulting in an improved quality of life for senior citizens.

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APPENDIX B

References

Andersen, R.E. (2000, November 28). The spread of the childhood obesity epidemic. *Canadian Medical Association Journal, 163(11),* 1461-1462.

Australia. Victorian Government Department of Human Services. (1999). *Victorian burden of disease study: Morbidity.* Victoria, Australia: Epidemiology Section, Health Intelligence and Disease Control, Public Health and Development Division, Victorian Government Department of Human Services.

Bailey, L.B., Rampersaud, G.C., & Kauwell, G.P. (2003, June). Folic acid supplements and fortification affect the risk for neural tube defects, vascular disease and cancer: Evolving science. *Journal of Nutrition, 133,* 1961S-1968S.

Bates, D.V. (2002). Sources, emissions, concentrations, exposures and doses. In D.V. Bates & R. B. Caton (Eds.). *A citizen's guide to air pollution* (2nd ed.). Vancouver, BC: David Suzuki Foundation.

Bates, D.V. & Vedal, S. (2002). Adverse health effects. In D.V. Bates & R. B. Caton (Eds.). *A citizen's guide to air pollution* (2nd ed.). Vancouver, BC: David Suzuki Foundation.

BC Centre for Disease Control. (2002, July). *2001 British Columbia annual report of reportable diseases.* Vancouver, BC: BC Centre for Disease Control. http://www.bccdc.org/content.php?item=33#0

BC Progress Board. (2002, December). *Toward British Columbia North Star 2010: Second annual benchmarking report of the BC Progress Board.* Vancouver, BC: BC Progress Board. http://www.bcprogressboard.com/report2.html

BC STATS. (2002, May). *BC population forecast 02/05.* Victoria, BC: Ministry of Management Services. Retrieved November 7, 2002, from http://www.bcstats.gov.bc.ca/data/pop/pop/project/bctab10.htm

BC STATS. (2003, February). *Consumer price index (1992=100) by fiscal year.* Victoria, BC: Ministry of Management Services. Retrieved March 25, 2003, from http://www.bcstats.gov.bc.ca/data/dd/handout/CPIFIS.pdf

BC STATS. (2003, April). *Labour Force Statistics.* Victoria, BC: Ministry of Management Services.

Brauer, M., Brumm, J. & Ebelt, S. (2000, July). *Evaluation of ambient air pollution in the Lower Mainland of British Columbia: Public health impacts, spatial variability, and temporal patterns.* BC: Administrative Council of Lower Mainland Medical Health Officers. http://www.southfraserhealth.com/images/whats_happening/pdfs/air%20quality%20report%20-%20final.pdf

Beamish, R., & Sanger, C. (Eds.). (1996). *Canadian development report 1996/97.* Ottawa, ON: The North-South Institute.

Beirness, D. (2000, Winter). Transformation legislative influence. *Recovery Magazine, 11(4).* Insurance Corporation of British Columbia. http://www.icbc.com/Library/recovery/volume11/Number4/articles/influence.html#

Bigham, M., Trepanier, M.J., & Dobson, S. (2002). Meningococcal disease in British Columbia – 2001 summary. *BC Medical Journal, 44(4)*, 203-210.

Birmingham, C.L., Muller, J.L., Papelu, A., Spinelli, J.J. & Anis, A.H. (1999, February). The cost of obesity in Canada. *Canadian Medical Association Journal, 160(4)*, 483-488.

Bohn, G. (2003, March 12). So many graduates, so few jobs. *Vancouver Sun,* p. A5.

Bosma, H., Marmot, M.G., Hemingway, H., Nicholson, A.G., Brunner, E., & Stansfeld, A. (1997). Low job control and risk of coronary heart disease in Whitehall II (prospective cohort) study. *British Medical Journal, 314,* 558-565.

Boulet, L., Becker, A., Berube, D., Beveridge, R., & Ernst, P. (1999, November 30). Canadian asthma consensus report [Special supplement]. *Canadian Medical Association Journal, 161*(Suppl. 11), 1-5.

British Columbia Cancer Agency. (2002). *2001/2002 annual report. Screening Mammography Program.* Vancouver, BC: BC Cancer Agency.

British Columbia Cancer Agency. (2002). *2002 annual report. Cervical Cancer Screening Program.* Vancouver, BC: BC Cancer Agency. http://www.bccancer.bc.ca/NR/rdonlyres/e7yzc5j5jhfpi3grzc5xgna6zo7qew6jrl3ntdgdpdm4qzfhjfa3n33ui5km4np2q7mqdg4p6d3ihg/2002CCSPAnnualReport.pdf

British Columbia. Ministry of Children and Family Development. (2002, May). *Measuring success: A report on child and family outcomes.* Victoria, BC: Ministry of Children and Family Development.

British Columbia. Ministry of Children and Family Development. (2003). *Indicators of early childhood health and well-being in British Columbia. Baseline report.* Victoria, BC: Ministry of Children and Family Development. www.mcf.gov.bc.ca/publications/measure_success/final_indicators_document.pdf

British Columbia. Ministry of Children and Family Development. (2003, January). *Additional indicators on early childhood health and well-being: An addendum to measuring success.* Victoria, BC: Ministry of Children and Family Development. http://www.mcf.gov.bc.ca/publications/measure_success/ecd_for_ms02.pdf

British Columbia. Ministry of Children and Family Development. (2003, January). *Service plan 2003/04-2005/06.* Victoria, BC: Ministry of Children and Family Development. http://www.bcbudget.gov.bc.ca/sp2003/cfd/cfd.pdf

British Columbia. Ministry of Health Planning. (2002). *Chronic disease management: Improving chronic disease management – a compelling business case for diabetes. Report from the Diabetes Working Group.* Victoria, BC: Ministry of Health Planning. http://www.healthservices.gov.bc.ca/cdm/research/index.html

British Columbia. Ministry of Health Planning. (2002, February). *BC health files emergency contraception pills. Health file #38e.* Victoria, BC: Ministry of Health Planning. www.bchealthguide.org/healthfiles/hfile38e.stm

British Columbia. Ministry of Health Planning. (2002, September). *How healthy are we? British Columbia's report on nationally comparable performance indicators.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/cpa/publications/how_healthy_sept2002.pdf

British Columbia. Ministry of Health Planning, University of British Columbia and Health Canada. (2003). *BC Nutrition Survey: Report on Physical Activity and Body Weight* [in press]. Victoria, BC: Ministry of Health Planning.

British Columbia. Ministry of Health Planning, University of British Columbia and Health Canada. (2003). *BC Nutrition Survey: Report on Energy and Nutrient Intakes* [in press]. Victoria, BC: Ministry of Health Planning.

British Columbia. Ministry of Health Planning. (2003, April). *Service plan 2003/04 – 2005/06.* Victoria, BC: Ministry of Health Planning. http://www.bcbudget.gov.bc.ca/sp2003/hp/hp.pdf

British Columbia. Ministry of Health Services. (2002). *Pharmacare trends 2002.* Victoria, BC: Ministry of Health Services. http://www.healthservices.gov.bc.ca/cpa/publications/pharmacare_trends_2002.pdf

British Columbia. Ministry of Health Services, Mental Health and Addictions. (2002, March). *Assessing the performance of the British Columbia mental health system: A provincial report 1999/2000* [draft]. Victoria, BC: Ministry of Health Services.

British Columbia. Ministry of Health Services. (2002, April). *A provincial anxiety disorders strategy.* Victoria, BC: Ministry of Health Services. http://www.healthservices.gov.bc.ca/mhd/pdf/anxietystrategy.pdf

British Columbia. Ministry of Health Services. (2002, October). *British Columbia's provincial depression strategy, phase I report.* Victoria, BC: Ministry of Health Services. http://www.healthservices.gov.bc.ca/mhd/pdf/depressionstrategy.pdf

British Columbia. Ministry of Health Services. (2003, April). *Service plan 2003/04 – 2005/06.* Victoria, BC: Ministry of Health Services. http://www.bcbudget.gov.bc.ca/sp2003/hs/hs.pdf

British Columbia. Ministry of Human Resources. (2002). *MHR exit survey – Fall 2002.* Victoria, BC: Ministry of Human Resources. http://www.mhr.gov.bc.ca/research/reports/MHR_Q3.pdf

British Columbia. Ministry of Public Safety and Solicitor General. (2002). *Police and crime summary statistics, 1992-2001.* Victoria, BC: Ministry of Public Safety and Solicitor General. http://www.pssg.gov.bc.ca/police_services/publications/TableOfContents.pdf

British Columbia. Ministry of Water, Land and Air Protection. (2002). *Environmental trends in British Columbia, 2002.* Victoria, BC: Ministry of Water, Land and Air Protection. http://wlapwww.gov.bc.ca/soerpt/pdf/ET2002Oct221.pdf

British Columbia. Office of the Premier. (2003). *Government's new era vision.* Victoria, BC: Office of the Premier. Retrieved January 30, 2003, from http://www.gov.bc.ca/prem/popt/service_plans/srv_pln/prem/new_era.htm

British Columbia. Office of the Provincial Health Officer. (1999). *Provincial Health Officer's annual report 1998, feature report: Immunization.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/pdf/phoannual1998.pdf

British Columbia. Office of the Provincial Health Officer. (2000, October). *A report on the health of British Columbians: Provincial Health Officer's annual report 1999.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/ar/index.html

British Columbia. Office of the Provincial Health Officer. (2000, December). *Antimicrobial resistance- A recommended action plan.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/pdf/antimicrobialfinal.pdf

British Columbia. Office of the Provincial Health Officer. (2001, January). *Policy and practice: A report on the use of British Columbia's health goals by B.C. government ministries.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/pdf/ppfinal.pdf

British Columbia. Office of the Provincial Health Officer. (2001, October). *Provincial Health Officer's Annual Report: Drinking water quality in British Columbia: The public health perspective.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/ar/index.html

British Columbia. Office of the Provincial Health Officer. (2002). *Provincial Health Officer's annual report 2001 - The health and well-being of Aboriginal people in British Columbia.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/ar/index.html

British Columbia. Office of the Provincial Health Officer. (2002, May). *Public health approach to alcohol policy. A report of the Provincial Health Officer.* Victoria, BC: Ministry of Health Planning. http://www.healthplanning.gov.bc.ca/pho/pdf/alcoholpolicy.pdf

British Columbia. Office of the Provincial Health Officer. (2003). *Prevention of falls in the elderly* [in press]. Victoria, BC: Ministry of Health Planning.

British Columbia. Office of the Provincial Health Officer. (2003). *An ounce of prevention: A public health rationale for the school as a setting for health promotion* [in press]. Victoria, BC: Ministry of Health Planning.

British Columbia Vital Statistics Agency. (2002, September). *Health status registry report 2002, congenital anomalies, genetic defects, selected disabilities.* Victoria, BC: British Columbia Vital Statistics Agency, Ministry of Health Planning. http://www.vs.gov.bc.ca/stats/hsr/hsr00/index.html

British Columbia Vital Statistics Agency. (2002, September). *Regional analysis of health statistics for Status Indians in British Columbia.* Victoria, BC: British Columbia Vital Statistics Agency, Ministry of Health Planning. http://www.vs.gov.bc.ca/stats/indian/indian2001/index.html

British Columbia Vital Statistics Agency. (2003, August). *Pregnancy Rates by Health Authority, British Columbia, 1993 to 2001.* Victoria, BC: British Columbia Vital Statistics Agency, Ministry of Health Planning. http://www.vs.gov.bc.ca/stats/hsr/hsr00/index.html

Calle, E.E., Rodriguez, C., Walker-Thurmond, K., & Thun, M. (2003, April 24). Overweight, obesity, and mortality from cancer in a prospectively studied cohort of U.S. adults. *New England Journal of Medicine 2003, 348,* 1625-1638.

Campbell, J.C. (2002, April 13). Health consequences of intimate partner violence. *The Lancet, 359,* 1331-1336.

Canada. Ministry of the Environment. (1990). *Canada's Green Plan: Canada's green plan for a healthy environment.* Ottawa, ON: Ministry of Environment.

Canadian Association of Food Banks. (2002, October). Eating their words: Government failure on food security. *Hunger Count 2002.* Toronto, ON: Canadian Association of Food Banks. http://www.cafb-acba.ca/pdfs/other_documents/HCFinal2002E.pdf

Canadian Cancer Society. (2003, April). *Canadian cancer statistics.* Ontario: Canadian Cancer Society, National Cancer Institute of Canada and Health Canada. http://129.33.170.48/stats_en.pdf

Canadian Cancer Society. (2003, April). *Smoking and lung cancer.* Ontario: Canadian Cancer Society. Retrieved May 12, 2003, from http://www.cancer.ca/ccs/internet/standard/0,3182,3172_367563_259538_langId-en,00.html

Canadian Centre for Philanthropy. (2001). *Caring Canadians, involved Canadians: Highlights from the 2000 National Survey of Giving, Volunteering and Participating.* Ontario: Statistics Canada. http://www.statcan.ca/english/freepub/71-542-XIE/71-542-XIE00001.pdf

Canadian Council of Ministers of the Environment. (2000, June). *Canada-wide standards for particulate matter (PM) and ozone.* Manitoba: Canadian Council of Ministers of the Environment. http://www.ccme.ca/assets/pdf/pmozone_standard_e.pdf

Canadian Institute for Health Information. (2001). *Supply, distribution and migration of Canadian physicians,* 2001. Ottawa, ON: Canadian Institute for Health Information.

Canadian Institute for Health Information. (2002). *Health system performance,* Ottawa, ON: Canadian Institute for Health Information. Retrieved February 17, 2003, from http://www.cihi.ca/hirpt/jsp/HIDispatcher.jsp

Canadian Institute for Health Information. (2003). *Health care in Canada.* Ottawa, ON: Canadian Institute for Health Information.

Canadian Public Health Association (2002, July). *Position paper 1 - Injury prevention and control in Canada: The need for a public health approach and coordinated national leadership.* Presented at the Annual General Meeting of the Canadian Public Health Association. Retrieved June 25, 2003, from http://www.cpha.ca/english/policy/resolu/2000s/2002/res2002e.pdf

Centers for Disease Control. (1999). Knowledge and use of folic acid by women of childbearing age—United States, 1995 and 1998. *Morbidity Mortality Weekly Report, 48,* 325-327.

Charlton, J.R.H. (1987). Avoidable deaths and diseases as monitors of health promotion. In T. Abelin, Z.J. Brzezinski, & V. Carstairs (Eds.), *Measurement in health promotion and protection* (pp. 467-479). Copenhagen, Denmark: World Health Organization, Regional Office of Europe.

Che-Alford, J., & Hamm, B. (1999, Summer). Under one roof: Three generations living together. *Canadian Social Trends, 53,* 6-9.

Cloutier, E., & Albert, T. (2001). *Economic burden of unintentional injury in British Columbia.* British Columbia: BC Injury Research and Prevention Unit and Smart Risk. Retrieved November 1, 2002, from www.injuryresearch.bc.ca/Publications/Reports/Economic%20Burden%20Report.pdf

Cooper, M. (1995). Aboriginal suicide rates: Indicators of needy communities. In P.H. Stephenson S.J. Elliott, L.T. Foster, & J. Harris (Eds.), *A persistent spirit: Towards understanding Aboriginal health in British Columbia* (pp. 207-222). Canadian Western Geographical Series Volume 31. Victoria, B.C.: University of Victoria, Department of Geography.

Craib, K.J.P., Spittal, P.M., Wood, E., Laliberte, N., Hogg, R.S., Li, K., Heath, K., et al. (2003). Risk factors for elevated HIV incidence among Aboriginal injection drug users in Vancouver. *Canadian Medical Association Journal, 168(1),* 19-24.

Cranswick, K. (1999, Spring). At work despite a chronic health problem. *Canadian Social Trends, 52,* 11-15.

Crum, C.P. (2002). The beginning of the end for cervical cancer? *New England Journal of Medicine, 347,* 1703-1705.

Czeizel, A.E. (1996). Reduction of urinary tract and cardiovascular defects by periconceptional multivitamin supplementation. *American Journal of Medical Genetics, 62,* 179-83.

Daly, P., & Weatherill, S. (2003). Public health follow up of reported cases of HIV infection in B.C. *B.C. Medical Journal, 45(3),* 122-123.

Dawar, M., Patrick, D.M., Bigham, M., Cook, D., Krajden, M., & Ng, H. (2003, March 18). Impact of universal preadolescent vaccination against hepatitis B on antenatal seroprevalence of hepatitis B markers in British Columbia women. *Canadian Medical Association Journal, 168(6),* 703-704.

Dhar, J. (2002, April 27). Sexual behaviour at the millennium – correspondence. *The Lancet, 359,* 1520-1521.

Dieticians of Canada. (2001, October). *The cost of eating in B.C.* Ontario: Dieticians of Canada.

Diez Roux, A.V., Stein Merkin, S., Arnett, D., et al. (2001). Neighborhood of residence and incidence of coronary heart disease. *New England Journal of Medicine, 345,* 99-106.

Duchesne, D. (2002). Seniors at work. *Summer 2002 Perspectives,* 33-44.

Eisenstat, S.A., & Bancroft, L. (1999, September 16). Domestic violence: A review. *New England Journal of Medicine, 341(12),* 886-892.

Feijoo, A.N. (2001, October). *Adolescent sexual health in Europe and the U.S. – Why the difference?* (2nd ed.). Washington, D.C.: Advocates for Youth. Retrieved June 10, 2003, from www.advocatesforyouth.org

Felker, B., Yazel, J.J., & Short, D. (1996, December). Mortality and medical comorbidity among psychiatric patients: A review. *Psychiatry Services, 47(12)*, 1356-1363.

First Nations Chiefs' Health Committee. (2000, March). *Our Nations on the edge of a new century: B.C. First Nations Regional Health Survey.* Vancouver, BC: First Nations Chiefs' Health Committee. http://www.fnchc.ca/_pdf/RHS.pdf

Fisher, E.S., Wennberg, D.E., Stukel, T.A., et al. (2003) The implications of regional variations in Medicare spending. Part 1: The content, quality and accessibility of care. *Annals of Internal Medicine, 138,* 273-287.

Fisher, E.S., Wennberg, D.E., Stukel, T.A., et al. (2003). The implications of regional variations in Medicare spending. Part 2: Health outcomes and satisfaction with care. *Annals of Internal Medicine, 138,* 288-298.

Fraser Basin Council. (2003, January). *A snapshot on sustainability: State of the Fraser Basin report.* Vancouver, BC: Fraser Basin Council. http://www.fraserbasin.bc.ca/documents/2003%20Sust%20Indicators%20RPT/FBC%20Sustainaiblity%20Report.pdf

Fraser Health Authority. (2001). *Fraser Health Authority health profile.* British Columbia: Fraser Health Authority.

Gangarosa, E.J., Galazka, A.M., Wolfe, C.R., Phillips, L.M., Gangarosa, R.E., Miler, E., et al. (1998). Impact of the anti-vaccine movement on pertussis control: The untold story. *The Lancet, 351,* 356-61.

Gaydos, C.A., Howell, M.R., Pare, B., Clark, K., Ellis, D.A. et al. (1998). Chlamydia trachomatis infections in female military recruits. *New England Journal of Medicine, 339(11),* 739-744.

Gelmon, K., & Olivotto, I. (2002). The mammography screening debate: Time to move on. *The Lancet, 359,* 904-905.

Genco, R., Offenbacher, S., & Beck, J. (2002, June 1). Periodontal disease and cardiovascular disease: Epidemiology and possible mechanisms. *Journal of American Dental Association, 133*(Suppl.), 14S-22S.

Gerbase, A.C., Rowley, J.T., & Mertens, T.F. (1998). Global epidemiology of sexually transmitted diseases. *The Lancet, 351*(Suppl. III), 24.

Goldner, E.M., Snider, B., & Mozel, M. (2000). Estimating the prevalence of mental disorders in adults. In *Defining the challenge: Epidemiology of mental disorder in British Columbia.* Retrieved July 3, 2003, from www.mheccu.ubc.ca

Gucciardi, E., Pietrusiak, M.A., Reynolds, D.L., & Rouleau, J. (2002). Incidence of neural tube defects in Ontario, 1986-1999. *Canadian Medical Association Journal, 167(3),* 238-240.

Health Canada. (1995, March). National goals and objectives for the control of vaccine-preventable diseases of infants and children. *Canada Communicable Disease Report,* 21-6, F2-F5. http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/95pdf/cdr2106e.pdf

Health Canada. (1997, November). *National goals for the prevention and control of sexually transmitted diseases in Canada.* Ottawa, ON: Health Canada. Retrieved May 13, 2002, from http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ccdr-rmtc/97vol23/23s6nat/index.html

Health Canada. (1999). *The prevention and management of asthma in Canada. A report from the National Asthma Task Force.* Ottawa, ON: Health Canada. Retrieved June 3, 2003, from www.hc-sc.gc.ca/pphb-dgspsp/publicat/pma-pca))/index.html

Health Canada. (1999, September). *Statistical report on the health of Canadians.* Ottawa, ON: Health Canada. http://www.hc-sc.gc.ca/hppb/phdd/report/stat/index.html

Health Canada. (2002). *Economic burden of illness in Canada, 1998.* Ottawa, ON: Health Canada. http://www.hc-sc.gc.ca/pphb-dgspsp/publicat/ebic-femc98/pdf/ebic1998.pdf

Health Canada. (2002, November). *Canadian Tobacco Use Monitoring Survey, annual results 2001.* Ottawa, ON: Health Canada. Retrieved March 27, 2003, from http://www.hc-sc.gc.ca/hecs-sesc/tobacco/research/ctums/2001/summary.html

Hollander, M. (2001). *Evaluation of the maintenance and prevention function of home care.* Victoria, BC: Hollander Analytical Services Ltd. www.hollanderanalytical.com/publications

Hollander, M.J., & Chappell, N. (2002, August). *Final report of the national evaluation of the cost-effectiveness of home care.* Victoria, BC: Hollander Analytical Services Ltd.

Hollander, M.J., & Prince, M.J. (2002, February). *Analysis of interfaces along the continuum of care.* Victoria, BC: Hollander Analytical Services Ltd. http://www.hollanderanalytical.com/downloads/continuum-final.pdf

Honein, M.A., Paulozzi, L.J., Matthews, T.J., Erickson, J.D., & Wong, L.C. (2001). Impact of folic acid fortification of the US food supply on the occurrence of neural tube defects. *Journal of the American Medical Association, 285,* 2981-2986.

Human Resources Development Canada. (2002). *The well-being of Canada's young children: Government of Canada report.* Ontario: Human Resources Development Canada and Health Canada.

Human Resources Development Canada. (2002). *Growing up in Canada: A detailed portrait of children and young people.* Ontario: Human Resources Development Canada and Statistics Canada. http://www.hrdc.gc.ca/sp-ps/arb-dgra/publications/books/class90/growing_up.shtml

Hutchison, B., Ostbye, T., Barnsley, J., Stewart, M., Mathews, M., Campbell, M.K., et al. (2003, April). Patient satisfaction and quality of care in walk-in clinics, family practices and emergency departments: The Ontario walk-in clinic study. *Canadian Medical Association Journal, 168,* 977-983.

Insurance Corporation of British Columbia. (2001). *Traffic collision statistics: Police-attended injury and fatal collisions.* British Columbia: Insurance Corporation of British Columbia. http://www.icbc.com/Library/research_papers/Traffic/B.C.%20Traffic%20Collision%20Statistics%202001.pdf#

Jenkins, R. (2002). Addressing suicide as a public health problem. *The Lancet, 359,* 813-814.

Katzmarzyk, P.T., Gledhill, N., & Shephard, R.J. (2000, November). The economic burden of physical inactivity in Canada. *Canadian Medical Association Journal, 163(11),* 1435-1440. http://www.cmaj.ca/cgi/reprint/163/11/1435.pdf

Kendall, P. (2003). HIV now reportable. *B.C. Medical Journal, 45(3),* 120.

Kennedy, M. (2003, March 4). Give tax breaks for healthy eating, governments told. *Vancouver Sun,* p. A5.

Kessler, R.C., McGonagel, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., et al. (1994, January). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry, 51,* 8-19.

Kohn, L.T., Corrigan, J.M., & Donaldson, M.S. (Eds.). (2000). *To err is human: Building a safer health system.* Washington D.C.: National Academy Press.

Koutsky, L.A., Ault, K.A., Wheeler, C.M., et al. (2002). A controlled trial of a human papillomavirus type 16 vaccine. *New England Journal of Medicine, 347,* 1645-1651.

Langer, E., & Rodin J. (1976). The effects of choice and enhanced personal responsibility for the aged. A field experiment in an institutional setting. *Journal of Personality and Social Psychology, 34(2),* 191-198.

Langer, E., & Rodin, J. (1977). Long-term effects of control-relevant intervention with the institutionalized aged. *Journal of Personality and Social Psychology, 35(12)*, 897-902.

Lear, S. (2003, March 5). Warning: Living may be dangerous to your health. *Vancouver Sun*, p. A18.

Lefebvre, S. (2002). Housing: An income issue. *Autumn 2002 Perspectives*, 28-35.

Lindsay, C. (1999, Spring). Seniors: A diverse group aging well. *Canadian Social Trends, 52*, 24-26.

Locust, C.S. (1999). Overview of health programs for Canadian Aboriginal Peoples. In J.M. Galloway, B.W. Godber, & J.S. Alpert (Eds.), *Primary care of Native American patients* (pp. 17-21). Woburn, MA: Butterworth-Heinemann.

Long, R. (2000). Drug resistant tuberculosis. *Canadian Medical Association Journal, 163(4)*, 425-428.

Long, R., Njoo, H., & Hershfield, E. (1999). Tuberculosis: Epidemiology of the disease in *Canada. Canadian Medical Association Journal, 160(8)*, 1185-1190.

Manfreda, J., Beclare, M., Sears, M., Chan-Yeun, M., Dimich-Ward, M., et al. (2001). Prevalence of asthma symptoms among adults aged 20-44 years in Canada. *Canadian Medical Association Journal, 164(7)*, 995-1001.

Manpower Demonstration Research Corporation. (2000). *What works best for whom: Impactsof 20 welfare-to-work programs by subgroup.* New York: Manpower Demonstration Research Corporation. Retrieve on August 21, 2003 from http://www.mdrc.org/publications/34/execsum.html

Marcil-Gratton, N. (1998, July). *Growing up with mom and dad? The intricate family life courses of Canadian children.* Ottawa, ON: Statistics Canada. http://www.statcan.ca/english/freepub/89-566-XIE/89-566-XIE.pdf

Maris, R.W. (2002). Suicide. *The Lancet, 360*, 319-326.

Marmot, M., & Wilkinson, R.G. (Eds.). (1999). *Social determinants of health.* Oxford and New York: Oxford University Press.

Marmot, M.G. (2001, July 12). Inequalities in health. *New England Journal of Medicine, 345(2)*, 134-136.

Marmot, M.G., Bosma, H., Hemingway, H., Brunner, E., & Stansfield, S. (1997). Contribution of job control and other risk factors to social variations in coronary heart disease incidence. The Lancet, 350, 235-239.

Marmot, M.G., Shipley, M.J., & Rose, G. (1984). Inequalities in death – Specific explanations for a general pattern? *The Lancet, 1984(1)*, 1003-1006.

McCain, M.N., & Mustard, J. (1999, April). Reversing the real brain drain: Early years study, final report. Ontario: Children's Secretariat, Government of Ontario.
http://www.mcfcs.gov.on.ca/cfcs/en/programs/children/ontarioearlyyearsplan/publications/earlyyearsstudy.htm

McCreary Centre Society. (1999). *Health connections: Listening to BC youth.* British Columbia: McCreary Centre Society.

McIver, S. (2001). *Medical nightmares: The human face of errors.* Toronto, ON: Chestnut Publishing Group.

Millar, W.J. (1998). Multiple medication use among seniors. *Health Reports, 9(4)*, 11-17.

Millar, W.J., & Locker, D. (1999). Dental insurance and use of dental services. *Health Reports, 11(1)*, 55-67.

Morrison, H.I., Ellison, L.F., & Taylor, G.W. (1999, February 1). Periodontal disease and risk of fatal coronary heart and cerebrovascular diseases. *Journal of Cardiovascular Risk, 6(1)*, 7-11.

Murray, C., & Lopez, A. (1996). Alternative visions of the future: Projecting mortality and disability, 1990 – 2020. *The Global Burden of Disease.* Cambridge: Harvard University Press.

National Steering Committee on Patient Safety.(2002). *Building a Safer System — A National Integrated Strategy for Improving Patient Safety in Canadian Health Care.* ON: Royal College of Physicians and Surgeons of Canada. Ontario. http://rcpsc.medical.org/english/publications/

Nichol, K.L., Nordin, J., Mullooly, J., Lask, R., Fillbrandt, K., & Iwane, M. (2003). Influenza vaccination and reduction in hospitalizations for cardiac disease and stroke among the elderly. *New England Journal of Medicine, 348,* 1322-1332.

Norris, M.J., Kerr, D., & Nault, F. (1995). Summary report on the projections of the population with Aboriginal identity, Canada, 1991-2016. ON: Statistics Canada.

Nyström, L., Andersson, I., Bjurstan, N., et al. (2002). Long-term effects of mammography screening: Updated overview of the Swedish randomized trials. *The Lancet, 359,* 909-919.

Oakley, G.P. (2002). Folic acid fortification: Time for a concentrated effort. *Canadian Medical Association Journal, 167(8),* 848.

Offord, D.R., Boyle, M.H., Campbell, D., et al. (1996). One-year prevalence of psychiatric disorder in Ontarians 15 to 64 years of age. *Canadian Journal of Psychiatry, 41,* 550-563.

Pérez, C.R. (2002, March). Fruit and vegetable consumption. *Health Reports, 13(3),* 23-29.

Persad, V.L., Van den Hof, M.C., Dubé, J.M., & Zimmer, P. (2002). Incidence of open neural tube defects in Nova Scotia after folic acid fortification. *Canadian Medical Association Journal, 167(3),* 241-245.

Phelps, C.E. (2003). What's enough, what's too much? [Editorial] *Annals of Internal Medicine, 138,* 348-349.

Philp, M. (2000, November 20). Face of child poverty changing. *The Globe and Mail,* p. A3.

Pomerantz, B.H. (1998). Incidence of adverse drug reactions in hospitalized patients. *Journal of the American Medical Association, 279,* 1200-1205.

Racine, Y., Boyle, M.H. (2002). Family Functioning and Children's Behaviour Problems, (pp.199-209) in J.Douglas Willms (ed.) *Vulnerable Children.* Edmonton: University of Alberta Press and Human Resources Development Canada.

Rekart, M.L., Patrick, D.M., Chakraboty, B., Maginley, J.J., Jones, H.D., Bajdik, C.D., et al. (2003). Targeted mass treatment for syphilis with oral azithromycin. *The Lancet, 361,* 313-314.

Rigotti, N.A. (2002). Treatment of tobacco use and dependence. *The New England Journal of Medicine, 346(7),* 506-510.

Ross, D.P., & Shillington, E.R. (1989, November). *A profile of the Canadian volunteer: A guide to the 1987 survey of voluntary activity in Canada.* Ottawa, ON: National Voluntary Organizations.

Scheifele, D., & Ochnio, J. (2002, July 9). Hepatitis A vaccine: Is it being used to best advantage? *Canadian Medical Association Journal, 167(1),* 44-45.

Sellors, J.W., Karwalajtys, T.L., Kaczorowski, J., Mahony, J.B., Lytwyn, A., et al. (2003, February 18). Incidence, clearance and predictors of human papillomavirus infection in women. *Canadian Medical Association Journal, 168(4),* 421-425.

Shaw, G.M., O'Malley, C.D., Wasserman, C.R., et al. (1995). Maternal periconceptional use of multivitamins and reduced risk for conotruncal heart defects and limb deficiencies among offspring. *American Journal of Medical Genetics, 59,* 536-545.

Sherrif, A., Golding, J., & Alspac Study Team. (2002). Hygiene levels in a contemporary population cohort are associated with wheezing and atopic eczema in preschool infants. *Archives of Disease in Childhood, 87,* 26-2.

Shine, K.I. (2003) Geographical Variations in Medicare Spending [Editorial]. *Annals of Internal Medicine, 138,* 347-348.

Simpson, L. (2002, August). *Perceptions of a problem report on hunger:* Trending update. Toronto, ON: Totum Research and Canadian Association of Food Banks. http://www.cafb-acba.ca/pdfs/other_documents/Totum2002E.pdf

Skowronski, D.M. et al. (2002, April). The changing age and seasonal profile of pertussis in Canada. *The Journal of Infectious Diseases, 185(10),* 1448-1538.

Soon, J.A., Lavine, M., & Schmidt, T. (2003) *Use of emergency contraceptive in women presenting for abortion in British Columbia: Differences and similarities across major language groups.*

Soubhi, H., Lisonkova, S., Rajabali, F., Tufts, C., & Raina, R. (2001). *Unintentional injuries in British Columbia: Trends and patterns among adults and seniors 1987-1998, Executive summary.* British Columbia: B.C. Injury Research and Prevention.

Statistics Canada. (1996). *Disability-free life expectancy, provinces and territories.* Ottawa, ON: Statistics Canada. http://www.statcan.ca/english/Pgdb/health38.htm

Statistics Canada. (1999, October). *A portrait of seniors in Canada* (3rd ed.). Ottawa, ON: Statistics Canada.

Statistics Canada. (2000, June). *Human activity and the environment.* Ottawa, ON: Statistics Canada.

Statistics Canada. (2001). *Access to health care services.* Ottawa, ON: Statistics Canada.

Statistics Canada. (2001). *Cancer incidence, 1999 national data and 2000 partial data.* Ottawa, ON: Statistics Canada.

Statistics Canada. (2001, August 15). Food insecurity in Canadian households. *The Daily.* http://www.statcan.ca/Daily/English/010815/d010815a.htm

Statistics Canada. (2002, March 13). Changes in unmet health care needs. *The Daily.* http://www.statcan.ca/Daily/English/020313/d020313a.htm

Statistics Canada. (2002, June). *Access to health care services.* Ottawa, ON: Statistics Canada. http://www.statcan.ca/english/freepub/82-575-XIE/tables.htm

Statistics Canada. Canadian Centre for Justice Statistics. (2002, June). *Family violence in Canada: A statistical profile 2002.* Ottawa, ON: Minister of Industry.

Statistics Canada. (2002, October 18). National longitudinal survey of children and youth: Childhood obesity. *The Daily.* http://www.statcan.ca/Daily/English/021018/d021018b.htm

Statistics Canada. (2002, October 22). *Profile of Canadian families and households: Diversification continues.* Ottawa, ON: Statistics Canada. http://www12.statcan.ca/english/census01/products/analytic/companion/fam/pdf/96F0030XIE2001003.pdf

Statistics Canada. (2002, December). *A profile of disability in Canada,* 2001. Ottawa, ON: Statistics Canada.

Statistics Canada. (2002, December 11). Household spending. *The Daily.* http://www.statcan.ca/Daily/English/021211/d021211a.htm

Statistics Canada. (2003, March 11). British Columbia: Highest education profile among the provinces. *2001 Census - Release 7.* http://www12.statcan.ca/english/census01/products/analytic/companion/educ/bc.cfm

Statistics Canada. (2003, March 26). Life after welfare. *The Daily.* http://www.statcan.ca/Daily/English/030326/d030326b.htm

Statistics Canada. (2003, May 21). British Columbia: Highest education profile among the provinces. *2001 Census - Release 8.* http://www12.statcan.ca/english/census01/products/analytic/companion/inc/canada.cfm

Statistics Canada. (2003, May 23). Social support and mortality among seniors. *The Daily.* http://www.statcan.ca/Daily/English/030523/d030523a.htm

Statistics Canada. (2003, June). *Income in Canada, 2001.* Ottawa, ON: Statistics Canada.

Statistics Canada. (2003, September 3). Canadian Community Health Survey: Mental health and well-being. *The Daily.* http://www.statcan.ca/Daily/English/030903/d030903a.htm

Strachan, D.P. (2000). Family size, infection and atopy: The first decade of the "hygiene hypothesis." *Thorax, 55*(Suppl. 1), S2-S10.

Tamblyn, R.M., McLeod, P.J., Abrahamowicz, M., & Laprise, R. (1996, April). Do too many cooks spoil the broth? Multiple physician involvement in medical management of elderly patients and potentially inappropriate drug combinations. *Canadian Medical Association Journal, 154(8),* 1177-1184.

Trail Health and Environment Committee. (2003). *Reaching out, 2(1).* Retrieved June 8, 2003, from http://mypage.direct.ca/t/tlp/

Tremblay, M.S., & Willms, J.D. (2000, November). Secular trends in the body mass index of Canadian children. *Canadian Medical Association Journal, 163(11),* 1429-1433. http://www.cmaj.ca/cgi/reprint/163/11/1429.pdf

University of Calgary. (2003, January). *Health and well-being of older Chinese in Canada.* Alberta: University of Calgary.

Van den Hof, M.C., & Persad, V.L. (2002). Folic acid fortification: Time for a concerted effort [Response to letter]. *Canadian Medical Association Journal, 167(8),* 848-849.

Vedal, S. (1995, June). *Health effects of inhalable particles: Implications for British Columbia.* BC: Air Resources Branch, Ministry of Environment, Lands and Parks. http://wlapwww.gov.bc.ca/air/particulates/vedairpt.pdf

Weir, E. (2001, September 4). Suicide: the hidden epidemic. *Canadian Medical Association Journal, 165(5),* 634-635.

Wellings, K., Nanchahal, K., Macdowell, W., McManus, S., Erens, B., Mercer, C.H., et al. (2001, December 1). Sexual behaviour in Britain: early heterosexual experience. *The Lancet, 358,* 1843-1850.

Wharton, B., & Booth, I. (2001). Fortification of flour with folic acid. *British Medical Journal, 323,* 1198-1199.

Wilkins, K. (1999). Medications and fall-related fractures in the elderly. *Health Reports, 11(1),* 45-53.

Wilson, R.M., Runciman, W.B., Gibberd, R.W., et al. (1995). The Quality in Australian Healthcare Study. *Medical Journal of Australia 163(9),* 458-471

Wilensky, G.R. (2003). The implications of regional variations in Medicare – What does it mean for Medicare. [Editorial] *Annals of Internal Medicine, 138,* 350-351.

Workers' Compensation Board. (2002). *2002 annual report.* British Columbia: Workers' Compensation Board. http://www.worksafebc.com/publications/reports/annual_reports/assets/pdf/ar2002.pdf

World Commission on Environment and Development. (1987). *Our common future.* Oxford, UK: Oxford University Press.

World Health Organization. (1997). *Obesity: Preventing and managing the global epidemic – report of a WHO consultation on Obesity.* Geneva: World Health Organization. Retrieved on July 15, 2003 from http://www.who.int/nut/documents/obesity_executive_summary.pdf

World Health Organization. (1995). Physical status: the use and interpretation of anthropometry: Report of a WHO expert committee. *World Health Organization, 854,* 1-452.

World Health Organization. (2001). *The world health report 2001, mental health: New understanding, new hope.* Geneva: World Health Organization.

Wright, C.J., Chambers, G.K., & Robens-Paradise, Y. (2002). Evaluation of indications for and outcomes of elective surgery, *Canadian Medical Association Journal, 167,* 461-466.

Wu, T., Trevisan, M., Genco, R.J., Dorn, J.P., Falkner, K.L., Sempos, C.T. (2000). Periodontal disease and risk of cerebrovascular disease: The first national health and nutritional examination survey and its follow up. *Archives of Internal Medicine, 160(18),* 2749-2755.

APPENDIX C

Definitions

HEALTH STATUS | WELL-BEING

Indicator and Definition	Rationale
Self-rated health: Proportion of the population, age 12 years and over, who rate their own health status as "excellent". **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	People's perceptions of their own health provide an overall measure of well-being. A person's self-rated health is often quite similar to results obtained through other measures.
Positive mental health: Proportion of the population, age 12 years and over, who have positive mental health, based on self-reported measure. Happiness is based on a question that asks respondents whether they are usually happy and interested in life. Self-esteem, mastery, and sense of coherence are based on standard scales for these measures. Cut-off points for a "high" level of self-esteem, mastery, and sense of coherence do not have an absolute meaning; however, they do allow for comparisons between population groups. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Canadian Community Health Survey, Statistics Canada. Happiness, self-esteem, mastery, and sense of coherence provide four ways to assess the population's level of mental health. Happiness is an overall measure of well-being and quality of life. Self-esteem refers to the general sense of self-worth as a person, while mastery measures the extent to which individuals feel their life chances are under their own control. Sense of coherence is a view of the world that events are comprehensible, challenges are manageable, and life is meaningful. Each of these attributes help people to enjoy life and to cope with life's stresses.

HEALTH STATUS | GENERAL HEALTH

Indicator and Definition	Rationale
Functional health: Proportion of the population, age 12 years and over, reporting very good health, a score of 0.80-1.00 on the Comprehensive Health Status Measurement System, which measures nine dimensions of functioning: vision, hearing, speech, mobility, dexterity, feelings, cognition, memory and pain. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Functional health status provides a broad assessment of health. This measure, developed at McMaster University, is based on a series of questions about a person's ability to function in the nine areas.
Activity limitation: Proportion of the population, age 12 years and over, who report having a disability or handicap or being limited in certain activities on a continuing basis because of a health problem. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Activity limitation gives us information about the effects that health problems are having on people's daily lives. Results are based on questions about whether individuals are limited on an ongoing basis because of a health problem. At the population level, a low rate may reflect success in preventing or treating diseases that cause disability. A low rate may also mean that health problems are having less of an impact on daily life due to differences in attitudes and/or environments. Wheel chair accessibility, for example, may lead to an improved level of independence and, thus, lower rates of activity limitation.
Disability-days, (Two-week disability days): Proportion of the population, age 12 years and over, who stayed in bed or cut down on normal activities because of illness or injury, on one or more days in the past two weeks. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	While activity limitation describes long-term health problems, two-week disability-days gives us a snapshot of health problems experienced within the previous 14 days. Like many health status indicators, two-week disability-days and other general measures do not change substantially from one year to the next. However, they are still useful indicators to monitor. As life expectancy continues to increase, measures such as two-week disability days, functional health, and activity limitation can help us to gauge whether those additional years of life are spent in good health.

HEALTH STATUS | HEALTH CONDITIONS

Indicator and Definition	Rationale
Overweight: Proportion of the population, age 20 to 64 years, who are overweight to the point of probable health risk (a Body Mass Index of 27.0 or greater). **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Body Mass Index (BMI) is a common measure of weight-for-height and can indicate whether a person's weight may be unhealthy. People who are overweight are at greater risk of developing a wide range of health problems, particularly high blood pressure, diabetes, heart disease, and certain types of cancer.
Chronic conditions: Proportion of the population, age 12 years and over, who report that they have been diagnosed by a health professional as having a chronic condition such as diabetes, arthritis, asthma, or allergies. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	The term "chronic conditions" covers a wide range of health problems that may last many years, and for which a complete cure may never be achieved. Chronic conditions can have profound effects on a person's life, whether it be a child with a serious birth defect, a young adult with a spinal cord injury, or an older adult with arthritis. The proportion of the population who have a chronic condition is an indirect measure of quality of life. It also provides information about the number of people requiring treatment or support services.
Chronic pain: Proportion of the population, age 12 years and over, who reported "no" when asked if they were usually free of pain or discomfort. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Pain that persists for a long time can interfere with all aspects of a person's life - their home life, their ability to work and play, and their social relationships. This indicator attempts to quantify the extent and level of pain and suffering, and therefore, reduced quality of life, that the population is experiencing. It can also be used as an overall measure of success of the health care system, because many treatment services are directed at reducing pain and suffering.
Mental illness: Proportion of the population, age 12 years and over, who are probably or possibly depressed, based on their responses to a set of questions that establishes the probability of having suffered a major depressive episode in the previous 12 months. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	There are many other mental illnesses besides depression but data are not available. Indicators on mental illness provide information about the prevalence and impact of mental health problems and the need for prevention, early intervention, treatment, and support services. The measure of depression is derived from a set of questions on mental health that involves thoughts and feelings about various subjects.

HEALTH STATUS | DEATHS

Indicator and Definition	Rationale
Infant mortality: The number of infants who die in the first year of life, expressed as a rate per 1,000 live births. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	The infant mortality rate - the number of babies who die in the first year of life, expressed as a rate per 1,000 live births – is a long-established measure, not only of child health, but also the social well-being of a society. A low rate reflects a healthy population, with good care and attention paid to the health of mothers and children.
Potential years of life lost: Potential years of life lost (PYLL) for males and females, from all causes and selected preventable causes, expressed as an age standardized rate per 1,000 standard population. PYLL is the number of years of life "lost" when a person dies before an established cut-off point, in this case age 75 years. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Potential Years of Life Lost (PYLL) focuses on premature deaths - deaths that occur in the younger age groups and that can, in theory, be prevented or postponed. PYLL is an overall indicator of population health, as well as the effectiveness of preventive programs. PYLL considers deaths before age 75 and weights them by age. A person dying at age 25, for example, has lost 50 years of life (75 minus 25 = 50 PYLL). To allow for meaningful comparisons, PYLL is expressed as an age standardized rate per 1,000 population.
Life expectancy: An estimate of the average number of years that a person born in that year is expected to live, based on current mortality rates, for males, females, and total. **Data Source** Source: BC STATS, B.C. Ministry of Management Services.	Life expectancy is used around the world as a basic indicator of the extent to which people are able to live a long life, that a population is healthy, has adequate food and access to health care, and is protected from disease and other threats that would shorten their life span. Although life expectancy measures quantity rather that quality of life, it remains a widely-used summary measure of population health.

GOAL 1: LIVING AND WORKING CONDITIONS | EMPLOYMENT

Indicator and Definition	Rationale
Unemployment rate: Proportion of the labour force who did not have a job during the reference period for the total population age 15 and over. **Data Source** Statistics Canada. Labour Force Survey, prepared by BC STATS, B.C. Ministry of Management Services.	The unemployment rate is a traditional measure of the health of the economy. It also indicates the social and economic status of groups within society. Unemployment is detrimental to health – of individuals, their families, and their communities. Not only does it mean reduced income, it can also mean a loss of self-esteem. Unemployed people experience more health problems, including depression, anxiety, disability-days, and hospitalizations than the employed.
Workplace injuries: Number of short-term disability claims per 100 person-years of employment accepted by the Workers' Compensation Board. **Data Source** Workers' Compensation Board of British Columbia.	Workers who are injured or become sick as a result of their work can suffer health effects, stress, and reduced incomes. Employee injuries are also a significant expense for employers, because of the time and costs arising from accident investigations, absenteeism, staff turnover, and lost productivity. The workplace injury rate is a key indicator of success in protecting workers from physical hazards.
Decision-latitude at work: Proportion of workers age 15 years and over who say they have a high degree of control over their work circumstances (who agree or strongly agree with the statement "I have a lot to say about what happens at my work"). **Data Source** National Population Health Survey, Statistics Canada.	In addition to physical safety, healthy workplaces provide an environment where workers are treated fairly and feel valued, and where they have variety and control over their work circumstances. Many international studies have found that people who are able to participate in decisions about their work are healthier and more productive. Adults spend about one-quarter of their lives at work. Decision-latitude provides one way to assess the quality of their working life.

Goal 1: Living and Working Conditions | Income

Indicator and Definition	Rationale
Low income rate: Proportion of persons with incomes below the Statistics Canada low-income cut-off (LICO) line, for selected age groups and family structures. The LICO line is calculated in relation to average expenditures on the essentials of food, clothing, and shelter. If an individual or family spends 20 percentage points more of its total income on these essentials than the average, then they fall below the LICO line. LICOs are set at income levels differentiated by family size and degree of urbanization; cut-offs are updated to compensate for changes in the Consumer Price Index. Low income rates may be calculated based on before-tax or after-tax income. **Data Source** Statistics Canada. *Income in Canada 2001,* Catalogue No. 75-202-XIE.	An adequate income allows people to purchase housing, food, and other basic needs. A stable and adequate income also provides security and control over the decisions people make - factors that are among the most important influences on health. The Low Income Rate - the proportion of the population with incomes below the Statistics Canada low income cut-off - is a consistent and well-defined method that identifies those who are substantially worse off than the average. Low income cut-offs (LICOs) represent levels of income where people spend too much of their money for food, shelter, and clothing, based on their family size and where they live. Canada does not have an official "poverty line". However, health and social service organizations often refer to the Low Income Rate as the "poverty rate".
Income assistance rate: Proportion of the population receiving British Columbia Employment and Assistance (BCEA) benefits, the provincial government program that provides financial assistance to individuals and families in need. Data do not include Aboriginal people living on-reserve. **Data Source** Data Services, Economic Analysis Branch, B.C. Ministry of Human Resources.	The income assistance rate tells us what proportion of the population is receiving government income assistance because they are in financial need. This provides an indication of the level of economic hardship that exists in population groups and communities throughout the province.
Income inequality: The income share of the bottom half (poorest) families. That is, the proportion of the population's household income that accrues to households earning less than the median income. **Data Source** 2001 Census, Statistics Canada. Special tabulations.	International studies have shown that in more egalitarian societies, people tend to live longer and have better health. Large differences in income between the rich and the poor can lead to inequalities in health and other aspects of life. Income inequality is measured in various ways, some of which require complex and technical calculations. One of the simplest ways to measure the gap between the rich and the poor is to determine the income share of the wealthiest and/or the poorest income groups, in this case, the bottom half (poorest) families. In a situation of perfect equality, the bottom half of families would receive half (50 per cent) of the total income. A region with aggregate incomes of families in the bottom half totaling closer to 50 per cent of all incomes in the region can be said to have more income equality.

GOAL 1: LIVING AND WORKING CONDITIONS | PARTICIPATION AND SOCIAL INTEGRATION

Indicator and Definition	Rationale
Social support: Proportion of the population, age 12 years and over who report a high level of social support, based on their responses to four questions about: (1) someone to confide in, (2) someone they can receive advice about a crisis, (3) someone they can count on for advice, and (4) someone who makes them feel loved and cared for. Overall social support is measured by a combination of scores from the above four indicators. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Friendship and social support networks - those people to whom we can turn, or who turn to us, for help, comfort, advice, and opinion - have a major influence on our health. Studies have repeatedly shown that the more friends and social support groups people have, the better the overall health of the group. Friendship and social support networks are important factors in making people feel valued and in helping them to cope when problems arise.
Volunteer rate: Proportion of the population, age 15 years and over who report having participated in volunteer activities in the past year. **Data Source** *1997 and 2000 National Survey of Giving, Volunteering, and Participating.* Statistics Canada.	Voluntary work has been described as the glue that holds society together (Ross and Shillington, 1989). Through volunteering, friends, colleagues, and neighbours work together, and this sharing of a common concern fosters a sense of belonging and trust and contributes to a community's "social capital" - a factor that is linked to health. Voluntary activity can be performed through a structured organization. Volunteering may also be done on a more informal or temporary basis, such as helping a friend or neighbour in need.
Crime rate: The number of Criminal Code offences expressed as a rate per 1,000 population, for violent crimes, property crimes, other, and total. Violent crimes are "person offences" which include homicide, attempted murder, sexual and non-sexual assault, abduction, and robbery. The crime rate is based on the number of incidents reported to or by the police. **Data Source** Policy Services Division, B.C. Ministry of Public Safety and Solicitor General.	Violence, both real and perceived, is hazardous to health, individual quality of life, and community spirit. The crime rate - the number of Criminal Code offences per 1,000 population - is an indirect measure of the extent to which people are engaging in anti-social, violent, and illegal activity. The crime rate is often used by health and social agencies as a measure of the ways we treat one another and the overall level of safety and security within a community.

Goal 1: Living and Working Conditions | Participation and social integration (Continued)

Indicator and Definition	Rationale
Children and youth in care: The number of children who are in the care of child welfare authorities, as a proportion of the total child population age 0 to 18 years. **Data Source** B.C. Ministry of Children and Family Development and BC STATS population estimates.	Most children live in families with one or both of their biological or adoptive parents. In cases where children and youth under 19 years of age are unable to live with their families, the Ministry of Children and Family Development provides substitute parenting. Children and youth come into the care of the Ministry for several reasons. Protection may be required due to abuse or neglect, parents may be absent or unable to care for their child, or the child may require special care of some type. A rising rate of children and youth in care may reflect increased awareness and reporting of child welfare concerns or changes in child welfare legislation. However, a growing rate of children in care may also indicate that more families are having difficulties caring for their children. Increases in family stress may be related to changes in the economy, patterns of employment and unemployment, or other social conditions.

Goal 1: Living and Working Conditions | Housing

Indicator and Definition	Rationale
Housing need: Proportion of renter households that are unable to afford suitable and adequate housing, based on the Core Housing Need index developed by the Canadian Mortgage and Housing Corporation (CMHC). **Data Source** Canadian Mortgage and Housing Corporation and Census, Statistics Canada.	Core housing need is an index used nationally to measure the number of households in an area that cannot find housing which is adequate (in good repair and with full bathroom facilities) and suitable (uncrowded) without spending more than 30 per cent of their gross household income on rent. As a general rule, households are considered to have affordability problems if more than 30 per cent of household income is spent on housing costs. At that level of spending, it is likely that there would not be enough money for other necessities such as food, clothing, and transportation, and households will face difficult choices such as sacrificing food, working longer hours, or relying on food banks. These choices may lead to poor health.

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES | HEALTHY CHILD DEVELOPMENT

Indicator and Definition	Rationale
Low birthweight: Proportion of live births with a birthweight less than 2,500 grams. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Babies born with a low birthweight (less than 2,500 grams) are more likely to die during the first year of life. They are also more likely to have problems such as birth defects, illnesses and poor health throughout childhood, and learning difficulties. The low birthweight rate is a well-established indicator of child health. It also tells us about the health of women and their ability to achieve healthy pregnancies. An adequate income, early prenatal care, and assistance with smoking cessation can reduce the occurrence of low birthweight. A high rate of babies born with low birthweight may indicate that some women are not receiving optimal prenatal care, education, and support.
Breastfeeding: proportion of infants age 3 months to 3 years who are currently breastfed or who were breastfed for at least three months. **Data Source** B.C. Ministry of Children and Family Development, using data from the National Longitudinal Survey of Children and Youth, Statistics Canada.	Breast milk is the ideal food for a baby's growth and development. Breast milk contains the optimal mix of nutrients, gives babies increased resistance to infections and fewer allergies, and provides opportunities for mother-infant bonding. The B.C. Ministry of Health Planning and other authorities have adopted the World Health Organization recommendation that breast milk be the only source of nutrients for most infants in the first four to six months of life. The breastfeeding rate measures our success in helping mothers to provide the best nutrition their babies can have.
Family functioning: Proportion of children living in "healthy functioning" families, as determined by a series of questions about how well the family works together. **Data Source** B.C. Ministry of Children and Family Development, using data from the National Longitudinal Survey of Children and Youth, Statistics Canada.	The family environment is the most important single influence on a child's health and well-being – an influence that lasts a lifetime. Families that are functioning well, where parents and children have positive interactions, with stability and consistency in the home, and other aspects of quality parenting help children develop a sense of identity and problem solving skills. Children who do not receive these protective factors often have more difficulty coping with life's challenges. "Family functioning" tells us about the quality and well-being of family environments. Results are based on a series of questions about how well the family works together in problem solving, communication, roles, emotional responsiveness, emotional involvement, and behaviour control.

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES | HEALTHY CHILD DEVELOPMENT (CONTINUED)

Indicator and Definition	Rationale
School readiness: Proportion of children who are "ready for school", based on two assessments: the Peabody Picture Vocabulary Test, which measures verbal ability of four and five-year olds and a set of questions that measure emotional and behavioural readiness. In the Peabody Picture Vocabulary Test, children with scores between 85 and 115 are considered to be in the normal range. Those with scores of 116 or more are advanced, while those scoring less than 85 are delayed. Behavioural readiness is assessed through a set of 43 questions that ask about children's aggression, anxiety, conduct, and social problems. **Data Source** B.C. Ministry of Children and Family Development, using data from the National Longitudinal Survey of Children and Youth, Statistics Canada.	Research shows what children who have been introduced to the basics and have a positive attitude toward learning will do better in school over the long term. Children who are not "ready for school" - intellectually or socially - may not be able to take full advantage of educational opportunities. There are different components to school readiness, and ways to measure it are still being developed, but experts believe school readiness is one of the most important indicators of children's well-being. Used at the population level, school readiness is one outcome of the environments that families, communities, and society as a whole are providing for young children. School readiness tells us about the quality of the resources available to children, including the family's income, parents' time and parenting practices, and community resources such as non-parental child care and family support programs. If children in some neighbourhoods or population groups consistently receive low school readiness scores, it means that these groups of children are not receiving the stimulation and interactions they need for optimal development.

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES | LEARNING OPPORTUNITIES

Indicator and Definition	Rationale
High school graduation and Post-secondary graduation: Proportion of the population age 25 to 64 years who have a high school graduation certificate or higher and the proportion who have a post-secondary certificate, diploma, or degree of some type, based on the Census questions about educational attainment. **Data Source** 1991 and 2001 Census, Statistics Canada.	Educational attainment - the highest level of schooling that people achieve - is closely linked to their social and employment status, income, and health. Graduation from high school is one level of attainment that is commonly used as a measure of success, because high school completion represents a stepping stone to post-secondary education and to the world of work. Finishing a post-secondary program is another important level of achievement, because it enables students to master specific skills and knowledge and helps them to pursue their chosen career path. The level of educational attainment reflects the overall quality of the home and community learning environments, as well as the quality of the education system.
Grade 12 exam completion rate: Proportion of Grade 8 students who completed their secondary education within six years and received a Dogwood Diploma. **Data Source** B.C. Ministry of Education.	Provincial examinations measure student learning in designated Grade 12 courses. English 12 and Mathematics 12 are key subject areas, because these courses are often core or preferred admissions requirements to post-secondary programs. The provincial exam completion rate is the number who took and passed the Grade 12 provincial exam, as a proportion of students enrolled in Grade 12. Information about exam results helps in monitoring and improving learning in literacy, mathematics, and other provincially-examinable subject areas.

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES | HEALTHY CHOICES

Indicator and Definition	Rationale
Smoking: Proportion of the population, age 12 years and over, who are current smokers. Current smokers are those who smoke cigarettes on either a daily or an occasional basis. Note: "Tobacco use" is a broader term that includes those who use alternate forms of tobacco. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Smoking is thought to be the single most important preventable cause of illness and death. The proportion of the population who smokes is a key measure of the success of policies and programs to reduce tobacco use.
Regular heavy drinking: Proportion of current alcohol drinkers, age 12 years and over, who report having had five or more drinks on one occasion, 12 or more times in the previous year. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	When used safely, alcohol can be an enjoyable part of the lives of many people without demonstrable harm. This is in contrast to tobacco, for which there is not a recognized safe level. But alcohol has the capacity to harm if not used in a safe and moderate fashion. Too much or inappropriate use of alcohol can lead to a range of health, work, family, and social problems. The birth defects and developmental problems that result from fetal alcohol syndrome, the traffic injuries and deaths resulting from driving while impaired, and the incidents of violence that are alcohol-related - all of these are preventable. The level of regular heavy drinking indicates the number of people who are likely to be problem drinkers, putting themselves and others at risk for alcohol-related problems.
Physical activity: Proportion of the population, age 12 years and over, who are physically active, based on their responses to questions about the frequency, duration, and intensity of their participation in leisure-time physical activity. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Physical activity has many health benefits. An adequate level of regular, vigorous physical activity helps to prevent serious illnesses and conditions, including heart disease, obesity, high blood pressure, adult-onset diabetes, osteoporosis, and depression. Physical activity also improves self-esteem, reduces stress, and provides opportunities for relaxation and socialization. In terms of its impact on population health, improving the number of British Columbians who are physically active is as important as reducing smoking. The proportion of the population who are physically active tells us how we are doing in promoting this healthy behaviour.
Healthy eating: Proportion of the population, age 12 years and over, who consume fruits and vegetables 5 or more times per day. **Data Source** Canadian Community Health Survey, Statistics Canada.	Healthy living means eating well and sensibly. The Canadian Food Guide recommends five to ten servings of fruits and vegetables per day. Fruits and vegetables high in vitamins, fibre and antioxidants are recommended along with a low fat diet to avoid certain cancers and heart disease. This indicator provides a measure of dietary practices of British Columbians.

Goal 2: Individual Capacities, Skills and Choices | Healthy choices (Continued)

Indicator and Definition	Rationale
Bicycle helmet use: Proportion of bicycle riders who say they always wear a helmet when riding a bike. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada.	Safety equipment prevents several types of injuries. Seat belts and infant car seats, bicycle and motorcycle helmets, personal flotation devices, smoke detectors, and child-proof container lids on medications are some examples of highly effective safety equipment. Since the early 1990s, British Columbia has been actively promoting the use of bicycle helmets. If consistently and properly used, helmets can prevent or reduce the severity of head injuries. Legislation requiring the use of bicycle helmets came into effect in British Columbia in September 1996, and community initiatives have been undertaken to raise awareness of helmets and other bicycle safety issues. Before legislation was introduced, more than 2,000 cyclists were involved in accidents with motor vehicles each year. Head injuries were the cause of most bicycle-related deaths, and accounted for more than half of the bicycle-related injuries. The rate of helmet usage is a measure of success in encouraging bicycle riders to adopt this safety behaviour.
High-risk sexual practices: Proportion of the population who have sexual behaviours that can lead to serious conditions such as sexually transmitted diseases, HIV infection, infertility, and unintended pregnancy. High-risk sexual practices include having multiple sexual partners, having sex without a condom (in a short term relationship), and not using an effective method of contraception. **Data Source** National Population Health Survey, Statistics Canada. Adolescent Health Survey, The McCreary Society.	The ability to have a responsible, satisfying, and safe sex life is a basic requirement for reproductive health (World Health Organization, 1994). Safe sexual practices are important, because risky behaviours can have serious results, including unintended pregnancy, sexually transmitted diseases, and HIV infection. Responsible decision-making, condom use, and use of contraception are promoted through sexuality education and awareness programs in schools and other settings. The proportion of the population who has high-risk sexual practices helps us to gauge the effectiveness of these reproductive health programs.
Teen pregnancy rate: The estimated number of pregnancies per 1,000 teenage women. The estimate is based on the number of pregnancies resulting in a live birth, stillbirth, induced abortion (ICD-9 635, 636, 638) performed in a hospital or in a clinic, or hospitalization due to miscarriage (ICD-9 630-634, 637). Multiple birth events (i.e., twins, triplets) are only counted as one pregnancy. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Deciding if, when, and how often to become pregnant is an important aspect of reproductive health. An unintended pregnancy exposes the parents and the child to a number of risks - physical, psychological, and/or social. Early teenage childbearing is of particular concern, because it can affect a young woman's development and life opportunities. Studies have shown that teen pregnancies can be reduced substantially if comprehensive sexuality education begins in the primary grades and if contraceptive services are available to adolescents. The teen pregnancy rate provides indirect information about the effectiveness of sexuality education and access to contraceptive services and products, as it is assumed that most pregnancies among teen women, particularly those under age 18 years, are unintended. Teen pregnancy is also commonly used as an indicator of social and economic conditions in a community; poverty, emotional deprivation, school failure, and lack of hope for the future are important factors in explaining teen pregnancy.

Goal 2: Individual Capacities, Skills and Choices | Independent living

Indicator and Definition	Rationale
Living in the community, age 65 years and over: Proportion of seniors, age 65 years and over who are living in the community (living alone or in families) versus living in collective dwellings (hospitals, care facilities, or other institutions). **Data Source** Statistic Canada. 2001 Census.	A sense of control over one's own life, ability to participate in daily social life, and the ways in which one is treated by others are major influences on health. Census data on the living arrangements of older citizens provide some facts about one aspect of independence - the independence that comes from remaining in the community.

Goal 3: Physical Environment | Air

Indicator and Definition	Rationale
PM_{10} air pollution: Percentage of monitored communities exposed to health risks from fine particulates for more than 18 days. Fine particulate (PM_{10}) levels exceeding 25 micrograms per cubic metre, are known to have adverse health effects. Data are based on measurements taken at sampling stations at locations throughout the province. Monitoring sites are often in communities where air quality is a concern; therefore, data do not necessarily reflect the average air quality in British Columbia. Airborne particles are divided into classes according to size. Particulate Matter 10 (PM_{10}), the size traditionally measured, refers to particles 10 micrometres or less (about one-eighth the width of a human hair). Recent research has shown than even smaller particles - 2.5 micrometres or less, called $PM_{2.5}$ - pose the greatest health risk. In the future, we will also report on levels of $PM_{2.5}$. **Data Source** Air Resources Branch, B.C. Ministry of Water, Land and Air Protection.	From a public health perspective, the most important outdoor air pollutants in British Columbia are small airborne particles - dust, dirt, soot, smoke, or droplets that are released into the air from factories, power plants, cars, fires, or other sources. These tiny particles can be inhaled into the lungs, leading to various health effects that range from cough and asthma attacks to cancer and premature death from respiratory disease. Scientific evidence shows that negative health effects start to appear when PM_{10} concentrations are greater than 25 micrograms per cubic metre. The amount of time that PM_{10} exceeds 25 micrograms per cubic metres can help in developing and evaluating actions to reduce air emissions to levels that protect human health.

GOAL 3: PHYSICAL ENVIRONMENT | AIR (CONTINUED)

Indicator and Definition	Rationale
Exposure to second-hand smoke: Proportion of non-smokers, age 12 years and over, who have daily or nearly-daily exposure to second-hand smoke at home, at work or school, or in other public settings. **Data Source** Canadian Community Health Survey, Statistics Canada.	Second-hand smoke is a dangerous toxin to which no one should be exposed against their wishes – whether at work, in public places, or in people's homes. While second-hand smoke is dangerous for people of all ages, it can be particularly harmful to children's lungs, with short-term and long-term health effects. Babies born to mothers who smoke during pregnancy have lower birth weights and a greater risk of Sudden Infant Death Syndrome (SIDS) than those mothers who do not smoke. Second-hand smoke can cause respiratory infections such as bronchitis and pneumonia, ear infections, and can increase the frequency and severity of asthma. Furthermore, children who see their parents and other role models smoking are more likely to take up smoking themselves, putting themselves at risk of lung cancer and other health problems later in life. The proportion of the population exposed to second-hand smoke measures the success of policies and programs to reduce exposure by making public places smoke-free, encouraging parents to maintain smoke-free homes, and reducing the use of tobacco.

GOAL 3: PHYSICAL ENVIRONMENT | WATER

Indicator and Definition	Rationale
Water quality index: Per cent of waterbodies rated excellent or good based on a composite index that measures the degree to which the various water uses are protected. An "excellent" rating refers to conditions very close to natural or pristine. All uses are protected and none are threatened or impaired. "Good" rating refers to conditions rarely depart from natural or desirable levels. All uses are protected, with only minor threats or impairment. **Data Source** B.C. Ministry of Water, Land and Air Protection.	Water has many uses. Humans use water for drinking, recreation, irrigation, and livestock watering. Other species – aquatic life and wildlife - use water, too. The B.C. Ministry of Water, Land and Air Protection has developed a Water Quality Index that measures the degree to which these various water uses are protected. The Index is based on attainment of water quality objectives for safe levels of contaminants and water conditions. Water bodies are selected for monitoring if they receive industrial, municipal, or agricultural discharges, and so could be polluted. Although only a small proportion of British Columbia's streams, rivers and lakes, aquifers, and marine areas are monitored, the Water Quality Index gives an indication of how well we are doing in protecting our water resources and in balancing the interests of all users. Water quality is considered to be an indicator of ecosystem vitality, much the same as blood pressure is for humans.
Boil-water advisories: The number of boil-water advisories in place at a given point in time. Boil-water advisories are used to notify the public that water is unsafe for human consumption because of microbiological contamination. **Data Source** B.C. Ministry of Water, Land and Air Protection.	Clean drinking water is a basic requirement for health. When water is unsafe for human consumption because of microbiological contamination, public health authorities issue an advisory to boil the water before drinking it. Trends in the number of boil-water advisories provide one indication as to whether the safety of drinking water supplies is improving or deteriorating.

GOAL 3: PHYSICAL ENVIRONMENT | FOOD

Indicator and Definition	Rationale
Critical hazards in food premises: Proportion of inspected food facilities, as part of the routine, complaint or follow up process, rated as "high" in critical hazard. Critical hazards are health hazards that require immediate attention. Food premises include restaurants and other establishments that serve meals to the public, food stores, and other facilities as defined by Food Premises Regulations. **Data Source** Business Planning, Surveillance and Epidemiology, B.C. Ministry of Health Planning.	Food and restaurant safety is considered so important to the health of the public that it is enshrined in legislation, primarily the *Health Act*, which, together with regulations and codes of practice, determines performance standards. Inspection of restaurants and other food establishments is one of the ways to ensure that high standards are maintained. Regular inspections help to identify unhealthy conditions or practices that, if not corrected, could lead to the spread of disease. In British Columbia, local health authorities are responsible for inspecting several types of food premises, including restaurants, catering services, fast food outlets, hospitals and care facilities, food stores, and other food premises such as slaughterhouses and food manufacturing plants. When food facilities are inspected, unsafe conditions called "hazards" are noted. Critical hazards are those health hazards that require immediate attention, such as inadequate refrigeration, improper cleaning of equipment, or problems with food handler hygiene. The number, rate, and type of critical hazards found provide information about the effectiveness of inspections, as well as programs to train and educate food handlers and their employers. If programs are successful, the number of critical hazards will be small, and all identified hazards will be corrected promptly.
Food quality samples meeting guidelines: Proportion of food samples for cooked ready-to-eat foods that were within all guidelines for bacteria and sanitary quality. Samples are taken when Environmental Health Officers suspect a problem, so this measure does not estimate risk in the total food supply. **Data Source** B.C. Centre for Disease Control.	Food testing is a well-established means of assessing contamination in the food supply. British Columbia has a food testing program that uses a "direct food analysis" approach. Environmental Health Officers collect food samples, which are submitted to the Provincial Laboratory for testing. Samples are analyzed to determine whether they comply with guidelines for bacteria and sanitary quality. Because Environmental Health Officers take samples when they suspect a problem, the results do not estimate risk in total food supply. However, the number and type of foods exceeding guidelines provides information about food safety problems and the need for additional standards, education, or enforcement.

Goal 3: Physical Environment | Land and Soil

Indicator and Definition	Rationale
Blood lead levels in children: Average blood lead levels in children age 0 to 3 years and the percentage of children with levels above the Trail Lead Program "level of concern" (15 μg/dL or higher). **Data Source** Trail Lead Program	High blood lead levels used to be among the most common childhood conditions. When the causes and health impacts were recognized, major efforts were made to decrease the levels of lead in gasoline, paint, industrial emissions and products intended for use by children. As a result, the risk to children's health from lead is now much lower than in the past. In Trail, lead in soil and house dust has been an issue. Young children are most affected by lead, because of their habit of putting toys and fingers into their mouths. Trends in average blood lead levels for Trail children show the effectiveness of community efforts and smelter emission reductions in reducing this exposure.

Goal 3: Physical Environment | Sustainability

Indicator and Definition	Rationale
Greenhouse gas emission: Total greenhouse gas emissions in megatonnes of carbon dioxide equivalents. **Data Source** B.C. Ministry of Water, Land and Air Protection.	Elevated levels of greenhouse gases cause changes to global climate, which may lead to increases in air pollution, expanding populations of pest species and vector-borne diseases, and impaired food production due to floods, droughts, and windstorms. The 1997 Kyoto Protocol, once in force, commits ratifying countries to reduce their greenhouse gas emissions. Canada's Kyoto target is to cut emissions to 6 per cent below 1990 levels by the period 2008 to 2012. B.C. is preparing a provincial climate change strategy encouraging the use of clean, renewable energy, greater efficiency in energy use, and a reduction of emissions in the industrial and transportation sectors.
Energy consumption: Total and per capita energy consumption. **Data Source** B.C. Ministry of Water, Land and Air Protection.	Canada uses more energy per capita than most countries. Factors that contribute to our high level of energy use include vast distances that encourage car use, size of the country relative to population density, cold climate, energy-intensive industries and relatively competitive energy prices. The consumption of conventional energy pollutes the atmosphere, depletes natural resources, and compromises the ability of future generations to use those natural resources. These impacts can be minimized by reducing overall consumption, by using energy more efficiently, and by developing alternative energy sources that are less stressful on the environment.
Land in protected areas: Areas protected, as a per cent of British Columbia's land base. In British Columbia, protected areas include national parks, ecological reserves, class A and C parks, recreation areas, and protected areas that fall under the *Environment and Land Use Act*. **Data Source** B.C. Ministry of Water, Land and Air Protection.	Protected areas are an important means of protecting biological and cultural diversity, protecting recreational resources and habitats, and providing for basic life-support functions such as absorbing waste and carbon dioxide. British Columbia has adopted the international target to have 12 per cent of its land base in protected status. This indicator measures success in meeting that commitment.

GOAL 4: HEALTH SERVICES | ACCESSIBILITY

Indicator and Definition	Rationale
Childhood immunization: Proportion of children who, by their second birthday, have been fully immunized against diphtheria, pertussis, tetanus, polio, *Haemophilus influenzae* Type b (Hib), measles, mumps, and rubella, according to the provincial immunization schedule. Rates are based on a one-month sample of children who are two years old in April of a given year and for whom child health records (HLTH 182) are available. **Data Source** Health Data Warehouse, data from Prevention and Wellness Planning Division, B.C. Ministry of Health Planning.	This indicator measures coverage or "uptake" rates for childhood immunization programs, compared to national and provincial targets. Routine immunizations for children are among the most cost-effective of all health interventions. Low rates indicate a problem in access to or delivery of this highly effective preventive health service.
Influenza immunization: Estimated proportion of (1) the population age 65 years and over and (2) residents and staff of care facilities who receive a dose of influenza vaccine during a given year ("flu season"). **Data Source** Prevention and Wellness Planning Division, B.C. Ministry of Health Planning.	Influenza is a major cause of illness, hospitalization, and death among the elderly and among people with certain medical conditions. Annual influenza vaccination prevents influenza-like illness and lessens the severity of disease when it does occur. At least half of the deaths, hospitalizations, and physician visits for influenza can be prevented with full implementation of the recommended immunization program. Annual influenza immunization is recommended for all adults age 65 and older, persons with chronic diseases in all age groups, and health care workers.
Screening mammography: Proportion of women age 50 to 74 years who attended the Screening Mammography Program of B.C. at least once in the past two years. **Data Source** *2001/02 Annual Report, Screening Mammography Program of B.C.*, BC Cancer Agency.	Screening mammography is an important strategy for early detection of breast cancer. Screening centres are the ideal way to identify and recruit women, because dedicated centres provide a standardized approach, quality control, and appropriate follow-up at the lowest unit cost. International studies have shown that screening mammography reduces breast cancer death rates by 25 per cent or more if women age 50-69 are screened every two years. The Screening Mammography Program of B.C. has extended the age group to 50-79, as program data show that women age 70-79 may also benefit from screening. Because regular attendance by 70 per cent of women is needed before a screening program will have optimal effect on death rates, the Screening Mammography Program has a long-term target to screen 70 per cent of women age 50-74 every two years. Screening rates measure the extent to which mammography screening programs are reaching their target group. Low rates may indicate that some women are experiencing problems accessing this service.

GOAL 4: HEALTH SERVICES | ACCESSIBILITY (CONTINUED)	
Indicator and Definition	**Rationale**
Pap smears: Proportion of women age 20 to 69 years who have had a Pap test within the last 20 months. **Data Source** *2002 Annual Report, Cervical Cancer Screening Program,* BC Cancer Agency.	Pap tests detect pre-malignant lesions before cancer of the cervix develops, allowing time for treatment that avoids progressive, fatal disease. Canadian and U.S. guidelines recommend screening women age 20-69 every three years, once several normal yearly smears have been obtained. Pap smear rates measure the extent to which cervical cancer screening programs are reaching the target population. Low rates may indicate that some women are experiencing problems accessing this service.
Smoking cessation services: Proportion of family physicians who actively counsel their patients to stop smoking, as evidenced by their participation in the BC Doctors' Stop-Smoking Program. **Data Source** BC Doctors' Stop Smoking Program.	Clinical tobacco intervention is a highly cost-effective health care intervention to motivate, treat and follow-up smokers to stop smoking (Canadian Guide to Clinical Preventive Health Care, US Clinical Practice Guidelines). Systematic intervention by the health care system – using chart-reminders to identify and follow-up smokers, consistent intervention by the clinical team, appropriate counseling, stop-smoking medications and follow-up, will at least double the baseline rate of stopping smoking. The proportion of GP's identified as delivering systematic clinical tobacco intervention is thus a good indicator of the involvement of the health care system. In addition, a recent randomized trial of clinical tobacco intervention prior to elective surgery demonstrated that pre-surgical smoking cessation significantly reduces major and minor complications of surgery.
Dental visits in past year: Proportion of the population, age 12 years and over, who report visiting a dentist in the past year. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada	Dental caries (tooth decay) is among the most common diseases known. Yet, most dental disease is preventable. Regular dental visits are an important part of dental health care. The proportion of the population who visit a dentist regularly provides an indication of access to this preventive service. Groups with low visit rates may be experiencing financial, geographic, or cultural barriers to dental care.
Unmet health care needs: Proportion of the population, age 12 years and over, who say they had at least one unmet health-care need during the previous year, i.e., they required care or advice on at least one occasion but did not receive it. **Data Source** National Population Health Survey, Statistics Canada. Canadian Community Health Survey, Statistics Canada	This measure describes people's perceptions of their unmet needs for care. Because accessibility is one of the fundamental principles of Canada's health care system, it is assumed that most people will be able to have their care needs met. A high rate of unmet needs, or large differences by income or other characteristics, could indicate that some groups are facing financial, geographic, or other barriers in accessing health services.

Goal 4: Health Services | Doing the Right Things Right

Indicator and Definition	Rationale
Opportunities for self-care: (1) General practitioner office visits for Time-Limited Acute Symptoms (TLAS), expressed as a rate per 1,000 population (age standardized). TLAS are common illnesses and symptoms such as colds, influenza, back ache, headache, and skin rashes, that are considered appropriate for self or home care. Conditions and diagnostic codes are based on a list provided by the Department of Public Health and Preventative Medicine of the Oregon Health Sciences University. (2) Emergency room visits for non-urgent conditions, expressed as a rate per 1,000 population (age standardized). These are physician services billed as Level 1 Emergency Care – emergency room visits that require only an abbreviated history, examination, and treatment and thus could be considered non-urgent. Rates can be calculated for all Level 1 visits, or for a subset of visits such as those for Time-Limited Acute Symptoms (TLAS). **Data Source** Health Information Access Centre, B.C. Ministry of Health Services. Prepared using claims data from the Medical Services Plan.	Individuals and families are the front-line providers of health care. Families and other caregivers usually decide on first-line treatment (such as over-the- counter remedies) and when to seek medical attention. As our understanding of health advances, it is important this front line of caregivers is educated about appropriate care. Doctors' office visits for common illnesses and non-urgent emergency room visits are two ways to measure opportunities for improving self-care. Not all of these visits could be avoided through self-care. However, results can be used to identify opportunities to educate the community about appropriate treatment of common diseases or to improve access to care in settings that are less intensive than the emergency room.
Use of protocols and guidelines: Estimated reductions in medical services usage and expenditures that occur due to the adoption of protocols and guidelines. Estimates are based on the difference between actual utilization and projected utilization of fee items for which protocols and guidelines have been adopted by the Guidelines and Protocols Steering Committee. **Data Source** Medical Services Plan, Medical and Pharmaceutical Services, B.C. Ministry of Health Services.	Protocols and clinical practice guidelines, particularly when combined with education and positive feedback, have been shown to improve both the quality and outcomes of health care. In British Columbia, protocols and guidelines are developed through the Guidelines and Protocols Advisory Committee, which include representatives from the B.C. Medical Association and the Medical Services Plan. This indicator looks at the estimated changes in services provided that occur once protocols and guidelines are in place. The primary purpose of protocols and guidelines is to improve the quality of health care. However, reduced expenditure is an additional benefit, because any cost savings can be re-directed to other needed health care services.

Goal 4: Health Services | Doing the Right Things Right (Continued)

Indicator and Definition	Rationale
Breast-conserving surgery: Proportion of female breast cancer surgery patients (ICD-9 diagnosis code of 174, acute, rehab, and day surgery levels of care) who receive breast-conserving surgery (Breast-conserving surgery includes all procedure codes 97.21, 97.22, 97.11, 97.27 or 97.28 and no code of 97.12, 97.14, 97.16 or 97.18. All breast cancer surgeries include all procedure codes 97.21, 97.22, 97.11, 97.27, 97.28, 97.15, 97.14, 97.16 or 97.18.) **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	Breast-conserving surgery (lumpectomy), followed by Radiation treatment, is the recommended procedure for most women with early breast cancer (The Steering Committee on Clinical Practice Guidelines for the Care and Treatment of Breast Cancer, 1998). Because breast-conserving surgery is less traumatic, physically and psychologically, it is considered the preferable option. A low rate of breast-conserving surgery suggests that some women may not be receiving the preferred, least invasive option. Variations in rates may be due to a number of factors including patient preferences, access to radiation treatment, and differences in physicians' patterns of practice.
Caesarean deliveries: Proportion of births that are delivered by caesarean section. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	In some cases, caesarean sections are essential for the health of a mother or baby. However, caesarean deliveries are a major surgical procedure, and they should not be done unnecessarily. Various guidelines exist defining appropriate indications for surgery. A review of research evidence by the World Health Organization suggested no clear health benefits from caesarean delivery rates above 10 to 15 per cent. Rates significantly above this level suggest that some women may be receiving surgeries that are not medically necessary.
Antibiotic prescribing: Proportion of children, age 0 to14 years, diagnosed with otitis media (ICD-9 381-382) who received a prescription for antibiotics after visiting a general practitioner and, of those who received a prescription, the proportion who received the first-line antibiotic recommended in the anti-infective guidelines. **Data Source** Health Information Access Centre, B.C. Ministry of Health Services. Prepared using data from Medical Services Plan and PharmaNet.	Otitis media (middle ear infection) is one of the most common problems of infancy and early childhood and accounts for about 10 per cent of children's visits to their family doctor. Most (about 80 per cent) ear infections will get better on their own, whether treated with antibiotics of not. The proportion of children who receive a prescription for antibiotics and the antibiotic prescribed provides information about compliance with antibiotic prescribing guidelines. A high rate indicates that some children may be receiving unnecessary or inappropriate drug treatments. In the longer term, too much use of antibiotics can lead to organisms that are resistant to first-line treatment.

Goal 4: Health Services | Doing the Right Things Right (Continued)

Indicator and Definition	Rationale
Preventable admissions to hospital: Hospitalizations for "ambulatory care sensitive conditions", conditions where hospital admission is usually not needed, if patients have timely access to high quality care in the community. Conditions are based on the list used by Alberta Health: primary diagnosis of ICD-9 or ICD-9-CM code 250 (diabetes), 300 (neurosis), 291-292 and 303-305 (alcohol-drug related), 311 (depression), 401-405 (hypertension), and 493 (asthma). Hospitalizations are expressed as a rate per 1,000 population (age standardized). **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	Diabetes, hypertension, asthma, depression, and other long-term conditions can usually be managed in the community, without the need for hospitalization. While not all admissions for these conditions are preventable, it is assumed that appropriate prior care could prevent a significant proportion. A disproportionately high rate is presumed to reflect problems in access to disease prevention and/or primary care services.
May not require hospitalizations: Hospitalizations classified as "May Not Require Hospitalization" (MNRH), expressed as a rate per 1,000 population (age standardized) and as a proportion of all acute care inpatient hospitalizations. MNRH is a classification developed by the Canadian Institute for Health Information. MNRH is used to describe cases in which the combination of diagnosis, procedure, and age usually mean that care could have been provided properly without the need for admission as a hospital inpatient. Examples are tonsillectomies, sprains and strains, hernia procedures without complications, and sore throat. **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	May Not Require Hospitalization identifies groups of patients who may have been admitted unnecessarily to hospital. These patients needed medical services, but not necessarily a hospital bed. A high rate of MNRH cases suggests the need to review in-patient cases to identify opportunities for providing more care in an out-patient setting.
Expected compared to actual stay: Average days that acute care patients spend in hospital, compared to their Expected Length of Stay (ELOS). Expected Length of Stay depends on the patient's diagnosis, their age, and whether they have complications that make their care more complex. Only "typical cases" are included in these comparative figures. The 2002/03 actual length of stay for all hospital inpatient acute and rehabilitation cases (which includes atypical cases such as those have signed out against medical advice, transferred out, etc.) was 6.3 days. **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	This indicator measures the amount of time patients spend in hospital, compared to what would be expected based on their particular condition. Hospitals or regions that consistently have shorter lengths of stay are considered to be more efficient, provided patients remain healthy after they are discharged.

GOAL 4: HEALTH SERVICES | DOING THE RIGHT THINGS RIGHT (CONTINUED)

Indicator and Definition	Rationale
Alternate level of care days: The number of days that Alternate Level of Care patients spend in acute care hospitals, as a proportion of all inpatient hospital-days. Alternate Level of Care patients are those who no longer require acute care or who are assessed or to be assessed for eligibility in extended care or intermediate care, but who remain in an acute care hospital pending transfer to a suitable facility or the necessary alternative care arrangements are made in the community. **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	This indicator is designed to assess whether patients are being placed in the most appropriate care setting. If many patients occupying acute care beds could be cared for elsewhere, this suggests problems with the availability of other types of care or difficulties with the placement process.
Community follow-up after hospitalization: Proportion of persons hospitalized for a mental health diagnosis who receive at least one contact with a community mental health centre or a fee-for-service psychiatrist or general practitioner within 30 days of discharge. Hospitalizations are based on in-patient separations (all levels of care) for patients age 15 to 64 with a primary diagnosis of ICD-9 290-314, V61 or V62. **Data Source** Mental Health Data Warehouse, claims data from the Medical Services Plan and Morbidity Database, B.C. Ministry of Health Services.	Most people who are hospitalized for psychiatric reasons require follow-up services once they are discharged from hospital. To maintain continuity of care and to prevent re-admission to hospital, most individuals should have at least one out-patient contact within 30 days of discharge. The proportion who have community follow-up within this time frame is a measure of the mental health system's responsiveness and continuity of care. A high rate of community follow-up indicates that hospital and community services are well coordinated and that community services are available and accessible.

GOAL 4: HEALTH SERVICES | IMPROVING HEALTH

Indicator and Definition	Rationale
Deaths due to medically-treatable diseases: Number of deaths and the age standardized mortality rate due to medically-treatable diseases according to Charlton's definition. The definition is based on mortality, in specific age groups, that could potentially be avoided through appropriate medical attention. Causes of death include hypertensive disease (age 5-64), cervical cancer (age 5-64), pneumonia and unspecified bronchitis (age 5-49), tuberculosis (age 5-64), asthma (age 5-49), chronic rheumatic heart disease (age 5-44), acute respiratory infections and influenza (age 5-49), bacterial infections (age 5-64), Hodgkin's disease (age 5-34), abdominal hernias, cholecystitis, and appendicitis (age 5-64), and deficiency anemias (age 5-64). **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	This indicator measures the effectiveness of the health care system in avoiding deaths that could have been prevented with appropriate medical management. If the health system is successful, the number of deaths due to medically-treatable diseases will be very low, approaching zero. Nevertheless, it is also important to evaluate the age standardized mortality rate for this measure so that the changing demographics of the population is accounted for.

GOAL 5: ABORIGINAL HEALTH | HEALTH STATUS

Indicator and Definition	Rationale
Self-rated health: Proportion age 12 years and over who identify with an Aboriginal group who rate their own health status as "excellent". **Data Source** Canada Health Promotion Survey 1990 and Post Censal Survey 1991, Statistics Canada Canadian Community Health Survey, Statistics Canada.	People's perceptions of their own health provide an overall measure of well-being. In fact, a person's self-rated health is often quite similar to results obtained through other measures.
Infant mortality: The number of infants who die in the first year of life, expressed as a rate per 1,000 live births, for Status Indian infants compared to infants in the total B.C. population. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	The infant mortality rate - the number of babies who die in the first year of life, expressed as a rate per 1,000 live births - is a long-established measure, not only of child health, but also the social well-being of a society. A low rate reflects a healthy population, with good care and attention paid to the health of mothers and children. The Status Indian infant mortality rate has improved dramatically over the past 40 years, but it remains about double the provincial rate. Sudden Infant Death Syndrome (SIDS) is the major contributor to higher death rates among Status Indian infants.

GOAL 5: ABORIGINAL HEALTH | HEALTH STATUS (CONTINUED)

Indicator and Definition	Rationale
Potential years of life lost: Potential years of life lost (PYLL), expressed as an age standardized rate per 1,000 standard population. PYLL is the number of years of life "lost" when a person dies before an established cut-off point, in this case age 75 years. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Potential Years of Life Lost (PYLL) focuses on premature deaths - deaths that occur in the younger age groups and that can, in theory, be prevented or postponed. PYLL is an overall indicator of population health, as well as the effectiveness of preventive programs. PYLL considers deaths before age 75 and weights them by age. A person dying at age 25, for example, has lost 50 years of life (75 minus 25 = 50 PYLL). To allow for meaningful comparisons, PYLL is expressed as an age standardized rate per 1,000 population. Status Indians in B.C. have a PYLL rate that is about three times that of other B.C. residents. Injury deaths are a major contributor to the higher PYLL rate among Status Indians..
Life expectancy: An estimate of the average number of years that a person born in that year is expected to live, based on current mortality rates, for Status Indian males, females, and total compared to the total B.C. population. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Life expectancy is used around the world as a basic indicator of the extent to which people are able to live a long life, that a population is healthy, has adequate food and access to health care, and is protected from disease and other threats that would shorten their life span. Although life expectancy measures quantity rather that quality of life, it remains a widely-used summary measure of population health. On average, Status Indians in British Columbia live seven years less than other B.C. residents.

GOAL 5: ABORIGINAL HEALTH | FACTORS AFFECTING HEALTH

Indicator and Definition	Rationale
High school completion rate: Proportion of the population, age 15 years and over, who have a high school graduation certificate or higher, based on the Census questions about educational attainment, for the Aboriginal population on-reserve, off-reserve, and total, compared to the non- Aboriginal B.C. population. **Data Source** 1996 Census Dimension Series – Profile of Aboriginal Population in Canada and 2001 Census, Statistics Canada.	Educational attainment - the highest level of schooling that people achieve - is closely linked to their social and employment status, income, and health. Graduation from high school is one level of attainment that is commonly used as a measure of success, because high school completion represents a stepping stone to post-secondary education and to the world of work. In general, Aboriginal students are less likely to complete high school than are non-Aboriginal students.
Unemployment rate: Proportion of the labour force, age 15 years and over, who did not have a job during the reference period, for the Aboriginal population on-reserve, off-reserve, and total, compared to the non-Aboriginal B.C. population. **Data Source** 1996 Census Dimension Series – Profile of Aboriginal Population in Canada and 2001 Census, Statistics Canada.	The unemployment rate is a traditional measure of the health of the economy. It also indicates the social and economic status of groups within society. Unemployment is detrimental to health – of individuals, their families, and their communities. Not only does it mean reduced income, it can also mean a loss of self-esteem. Unemployed people experience more health problems, including depression, anxiety, disability-days, and hospitalizations than the employed. Traditionally, Aboriginal people have faced disadvantages in employment, including high unemployment, occupational segregation, pay inequities, and limited opportunities for career progression.

Goal 5: Aboriginal Health | Factors Affecting Health (Continued)

Indicator and Definition	Rationale
Low income rate: Proportion of the Aboriginal population, age 15 years and over, with total income below $10,000, on-reserve, off-reserve, and total, compared to the non-Aboriginal B.C. population. **Data Source** 1996 Census Dimension Series – Profile of Aboriginal Population in Canada and 2001 Census, Statistics Canada.	There is a close relationship between income and health. An adequate income is important for health and conversely, low income is associated with poor health. Data are not readily available on the proportion of the Aboriginal population with incomes below the low income cut-off (see Low Income Rate, Goal 1). However, statistics are available on the proportion with total income below $10,000.
Community control: Proportion of Aboriginal communities that have taken steps towards achieving community self governance, as measured by factors such as engagement in treaty negotiations and control over local health and social services (education, health care, cultural facilities, police/fire services). **Data Source** Office of the Provincial Health Officer. (2002). *Provincial Health Officer's Annual Report 2001 - The health and well-being of Aboriginal people in British Columbia.*	Individuals and communities are healthier when they are empowered and have a sense of control over their lives and their destinies. In recent years, the importance of preserving cultural identity and involving Aboriginal communities in control of community services has been recognized. The proportion of communities that are working towards self-governance reflects progress in supporting Aboriginal people to achieve self-determination and a collective sense of control.

Goal 6: Disease and Injury Prevention | Non-communicable Disease

Indicator and Definition	Rationale
Heart disease and stroke deaths: The number of deaths from ischemic heart disease (I20-I25), stroke (I60-I69), other circulatory system diseases, and total (I00-I99), expressed as a rate per 10,000 population (age standardized). **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Circulatory diseases, which include ischemic heart disease and stroke, are largely preventable. Even small reductions in the major risk factors (smoking, high blood pressure, and high blood cholesterol) can lower a population's death rate. Death rates measure long-term success in reducing deaths due to circulatory diseases compared to other regions, provinces, and countries. Lower death rates indicate success in disease prevention, early detection, and treatment.
Cancer incidence and mortality: The number of new cases and deaths from cancer, for all cancer (C00-C97) and for specific sites including trachea and lung (C33-C34), female breast (C500-C509) and prostate (C61) expressed as a rate per 10,000 population (age standardized). **Data Source** Cancer Incidence, 1999 national data and 2000 partial data, Canadian Cancer Registry Shelf Tables, Statistics Canada. B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Some forms of cancer are preventable. For others, deaths can be reduced through screening and early detection. Cancer incidence and death rates measure long-term success in cancer control, compared to other regions, provinces, and countries. Lower rates indicate success in cancer prevention, detection, and treatment.

GOAL 6: DISEASE AND INJURY PREVENTION | NON-COMMUNICABLE DISEASE (CONTINUED)

Indicator and Definition	Rationale
Respiratory disease deaths: The number of deaths from respiratory disease, for influenza and pneumonia (J10-J18), chronic obstructive pulmonary disease (J44), asthma (J45-J46) and total (J00-J98), expressed as a rate per 10,000 population (age standardized). **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	This indicator measures long-term success in reducing deaths due to respiratory disease, compared to other regions, provinces, and countries. Lower death rates indicate success in respiratory disease prevention, detection, and treatment. Preventive actions include reducing tobacco use, avoiding exposure to tobacco smoke and other environmental risks, and use of influenza and pneumococcal vaccines.
Mental health hospitalizations: The number of hospital admissions due to mental disorders (ICD-9 290-319, principal diagnosis, acute care), expressed as a rate per 1,000 population, and average length of stay in hospital. **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	Hospital usage provides one measure of the impact of mental illness - on individuals and on the health care system. Early identification, effective treatment, and community supports can reduce the need for acute care hospitalization. High admission rates and long lengths of stay can flag opportunities for improvement in community care for persons with mental illness. The mental health hospitalization rate also provides an estimate of the rate at which severe mental illness is occurring in the population.
Neural tube defects: The number of anencephalus and neural tube defect cases (ICD-10 Q00, Q01, Q05, Q07.0) reported to the Health Status Registry, expressed as a rate per 1,000 total births (live births and stillbirths). **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Neural tube defects are serious birth defects of the brain and spinal cord, which occur in approximately one of every 1,000 births. Research suggests that at least 50 per cent of neural tube defects can be prevented, if women consume sufficient amounts of folic acid prior to conception and during the early weeks of pregnancy. The rate of neural tube defects reflects the success of actions to increase folic acid consumption through diet, supplementation, or fortification of foods during processing. The rate of neural tube defects is also considered to be an overall indicator of the health of a population. During periods of famine, war, economic depression, and limited access to prenatal care, the rate of neural tube defects goes up. Conversely, during periods of prosperity, the rate of neural tube defects goes down.

Goal 6: Disease and Injury Prevention | Communicable Disease

Indicator and Definition	Rationale
Vaccine-preventable disease: The number of cases of vaccine-preventable diseases reported to health authorities in a given year, expressed as a rate per 100,000 population. Diseases include diphtheria, *haemophilus influenzae* Type b (Hib), hepatitis B, measles, mumps, pertussis, rubella, tetanus, pneumococcal disease, hepatitis A, cholera, meningococcal disease, rabies, typhoid, and yellow fever. Influenza is also vaccine-preventable, but influenza is monitored through surveillance network that involves selected physicians, the Provincial Laboratory, and reports about high levels of influenza-like illness in care facilities and schools. **Data Source** B.C. Centre for Disease Control.	Of the several hundred communicable diseases that exist in the world today, at least 20 can be prevented to some extent through immunization. The number and rate of cases measures the success of immunization and other efforts to prevent and control these diseases.
Tuberculosis: The number of active cases of tuberculosis (new active and reactivated) reported in a given time period, expressed as a rate per 100,000 population. **Data Source** B.C. Centre for Disease Control.	Tuberculosis is a serious but treatable disease that continues to be a health problem among high-risk groups, which include Aboriginal people and immigrants from countries where tuberculosis is common. The number and rate of new cases measures progress in tuberculosis control. It also reflects a community's socioeconomic status and general health status.
HIV infection: The number of persons who tested HIV-positive for the first time in a given year, expressed as a rate per 100,000 population. Information is based on those who are tested for HIV and whose positive tests have been reported to the B.C. Centre for Disease Control Society. Data do not represent the total number of people who are infected with HIV during a given time period; the degree of under-reporting varies by age group, region, and risk category. **Data Source** B.C. Centre for Disease Control.	This indicator provides an estimate of the rate at which HIV infection is occurring in the population. It measures the results of efforts to control the spread of HIV and prevent outbreaks; strategies include: prevention programs aimed at high-risk communities, access to early testing, improved access to antiretroviral treatments, and actions to address the underlying factors that place people at increased risk of HIV infection. The incidence of HIV also provides an estimate of the future burden of illness and death due to AIDS.
Sexually transmitted diseases: The number of new cases of chlamydia, gonorrhea, and infectious syphilis reported to health authorities in a given year, expressed as a rate per 100,000 population. **Data Source** B.C. Centre for Disease Control.	Chlamydia, gonorrhea, and syphilis are the three major sexually transmitted diseases that are reportable to local and national health agencies. These diseases can be controlled - perhaps even eliminated - through screening of high-risk groups, prompt and complete treatment, and efforts to identify and treat sexual partners of infected persons. The rate at which new cases occur reflects, in part, the success of programs to prevent and control these diseases. High rates may also reflect increases in the level of testing.

GOAL 6: DISEASE AND INJURY PREVENTION | COMMUNICABLE DISEASE (CONTINUED)

Indicator and Definition	Rationale
Food and waterborne diseases: Number of reported cases as rate per 100,000 population For reported cases, diseases include amebiasis, botulism, brucellosis, campylobacteriosis, cholera, cryptosporidiosis, E. coli, giardiasis, hepatitis A, listeriosis, paratyphoid, salmonellosis, shigellosis, trichinosis, typhoid, and yersiniosis. **Data Source** B.C. Centre for Disease Control.	These measures provide an estimate of the occurrence of enteric (intestinal) diseases, many of which are caused by consuming contaminated food or water, and the burden of those diseases on the health care system. Rates based on reported cases are known to be an under-estimate, as many cases of intestinal illness are not recognized or reported. However, rates can be used to raise awareness of the problem of food and waterborne disease and the importance of protecting food and water supplies through activities such as water treatment, watershed management, and promotion of safe food handling and storage practices.
Waterborne diseases outbreaks: The number of waterborne disease outbreaks that occur in a given year. An outbreak is an incident where two or more persons experience a similar illness after consumption of water intended for drinking, and epidemiologic evidence indicates water as the source of illness, and/or in the opinion of the Medical Health Officer a waterborne disease outbreak is occurring. **Data Source** B.C. Ministry of Health Services.	The number of waterborne disease outbreaks is a measure of success in protecting the quality of British Columbia's drinking water. Water systems and watersheds must be carefully managed in order to reduce the risk of contamination. A target of zero waterborne disease outbreaks is a goal towards which to aim, but this may not always be achievable, even with careful management of water supplies.
Unintentional injuries: The number of hospitalizations and deaths due to unintentional injuries, among children and youth (age 0 to 24 years) and all ages, expressed as a rate per 100,000 (age standardized). The term unintentional ("accidental") includes injuries due to causes such as motor vehicle collisions, falls, drownings, burns, and poisoning. **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	Injury rates provide information about the safety of the environments in which people live, work and play, the safety of the products they use, and risk-taking behaviour, especially among youth. Hospitalization and death rates measure long-term success in reducing unintentional injuries, compared to provincial goals and targets. Results reflect the adequacy and effectiveness of injury prevention efforts, including public education, product development and use, community and road design, and prevention and treatment resources.
Hip fractures: The number of hospitalizations for fracture of the hip (primary diagnosis of ICD-9 820.0-820.3, 820.8, 820.9), expressed as a rate per 1,000 population age 65 years and older. **Data Source** Discharge Abstract Database, Information Support, B.C. Ministry of Health Services.	Falls are a major problem among the elderly. As well as causing disability or death, hip fractures resulting from falls can have a major impact on independence and quality of life. There is no ongoing system to collect information about the falls that people experience. Hip fracture hospitalizations, for which data are readily available, provide one indication of the rate at which serious falls are occurring. Because osteoporosis is a major cause of fractures, hip fracture hospitalizations are sometimes used to provide a measure of the impact of this disease.

GOAL 6: DISEASE AND INJURY PREVENTION | INJURIES

Indicator and Definition	Rationale
Domestic violence: The number of Criminal Code incidents (e.g., assault, homicide, criminal harassment) that contain supplementary information indicating that a crime occurred against a spouse or an intimate partner, expressed as a rate per 1,000 population. Spouse or an intimate partner is defined as a marital partner, a common-law partner, or a partner in a dating or intimate relationship. **Data Source** Policy Services Division, B.C. Ministry of Public Safety and Solicitor General.	Spousal assault rates provide an indication of the level of violence that is occurring in spousal relationships. It measures violence against women in particular, as most assaults involve a male offender and a female victim. This indicator can help emphasize the criminality of violence and the importance of taking measures to ensure that individuals who may be at risk are protected.
Child abuse and neglect: The number of confirmed reports of abuse or neglect (as defined under the *Child, Family and Community Service Act*), expressed as a rate per 1,000 population age 0 to 18. Data refer to child protection complaints that result in a section 16 investigation and a finding by the worker, in consultation with the supervisor, that the child is in need of protection. Such a finding does not necessarily result in admission to care, as other protective services may be more suitable. **Data Source** B.C. Ministry of Children and Family Development.	Abuse or neglect by a parent or other caregiver presents a serious threat to a child's health. In the short term, abuse or neglect can result in physical harm or even death. Abuse can also lead to developmental or behavioural problems, or to mistreatment of the child's own children in later life. This indicator suggests the extent to which children's security is threatened rather than protected by the adults on whom they are most dependent. Data are based on the number of complaints reported and confirmed. Although there is a requirement to report all cases of suspected abuse, some cases are not reported.
Illicit drug overdose: The number of deaths due to illicit drug overdose, as determined by the B.C. Coroners Service, expressed as a rate per 100,000 population age 15 to 64 years. **Data Source** B.C. Coroners Service, Ministry of Public Safety and Solicitor General. Population estimates are from the BC STATS, B.C. Ministry of Management Service.	For the past decade, British Columbia has had an epidemic of deaths and disease related to injection drug use. Deaths and other harms associated with injection drug use can be greatly reduced through comprehensive and coordinated harm reduction strategies. The number and rate of illicit drug deaths provides one indication of the success of efforts to address this health and social issue.
Suicide: The number of suicide deaths, expressed as a rate per 10,000 population (age standardized). **Data Source** B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.	This indicator measures long-term success in reducing suicide, a social as well as a major public health concern. Suicide rates can be reduced by focussing on the underlying social causes, developing coping skills, treating mental illness, and reducing the availability of guns and other means of suicide.

APPENDIX D

Regional Data

HEALTH STATUS

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
0 Population (2002)																	
Female	39,655	39,671	159,960	107,913	126,931	278,186	309,322	89,561	298,681	136,678	206,590	121,901	27,366	40,650	73,766	31,350	2,088,181
Male	40,553	39,905	151,918	108,671	127,329	274,388	305,060	85,056	292,926	132,199	192,841	118,496	28,748	43,832	77,503	33,666	2,053,091
Total	80,208	79,576	311,878	216,584	254,260	552,574	614,382	174,617	591,607	268,877	399,431	240,397	56,114	84,482	151,269	65,016	4,141,272
Projection (2030)	75,037	91,777	474,261	289,901	410,530	898,889	992,320	215,496	721,891	341,035	501,078	343,040	66,310	96,602	174,780	79,129	5,773,181
Land Area in km²	45,085	28,803	21,299	120,160	12,437	2,574	858	135	131	58,293	5,494	11,127	39,429	244,298	176,491	167,555	934,169
1 Self-rated health (2000/01)																	
Per cent rated 'excellent'	24.1%	22.7%	23.9%	26.4%	22.8%	23.8%	23.8%	21.0%	23.5%	32.0%	25.7%	22.5%	22.9%	20.8%	20.6%	22.8%	24.2%
2 Positive mental health (2000/01)																	
Per cent rated 'moderate' or 'high' for mastery	75.8%	74.5%	74.8%	72.2%	75.3%	70.3%	68.0%	62.6%	59.3%	64.8%	78.3%	78.7%	70.7%	78.2%	66.9%	69.8%	69.8%
Per cent rated 'moderate' or 'high' for self-esteem	84.2%	80.4%	76.3%	75.3%	79.7%	72.4%	72.3%	69.6%	62.5%	66.2%	79.7%	78.7%	79.3%	77.9%	68.0%	70.9%	72.6%
3 Functional Health (2000/01)																	
Per cent rated 'very good or perfect'	74.6%	74.1%	74.5%	78.2%	75.2%	81.0%	79.2%	80.7%	80.2%	84.0%	79.6%	75.7%	76.8%	82.4%	77.4%	80.4%	78.9%
4 Activity limitation (2000/01)																	
Per cent reported having a disability	28.6%	30.0%	32.9%	27.6%	28.3%	22.9%	23.2%	15.8%	19.4%	23.8%	31.6%	29.7%	28.6%	21.5%	27.7%	28.4%	25.3%
5 Disability-days (2000/01)																	
Per cent with 'disability days'	17.4%	20.6%	21.5%	20.4%	20.0%	14.7%	19.2%	13.0%	14.9%	17.3%	21.1%	19.8%	21.1%	17.0%	21.9%	18.2%	18.2%
6 Overweight (2000/01)																	
Per cent overweight based on Body Mass Index (BMI)	35.5%	29.9%	31.9%	33.9%	34.6%	27.1%	30.5%	17.8%	14.5%	21.2%	26.3%	31.3%	33.0%	40.7%	32.9%	34.4%	27.0%
7 Chronic Conditions (2000/01)																	
Has arthritis	20.5%	18.8%	20.4%	16.3%	17.6%	11.8%	13.5%	11.6%	9.1%	14.4%	16.8%	18.2%	17.8%	13.3%	13.6%	14.3%	14.5%
Has asthma	-	8.0%	8.7%	7.3%	9.4%	8.7%	7.0%	6.4%	6.6%	6.5%	8.5%	7.8%	-	6.3%	8.4%	-	7.6%
Has diabetes	-	-	4.0%	4.3%	5.5%	4.0%	-	-	4.0%	2.9%	3.6%	4.2%	-	-	4.3%	-	3.9%
Has high blood pressure	11.1%	11.4%	14.4%	11.2%	12.8%	10.8%	10.6%	10.7%	9.9%	8.6%	13.3%	12.5%	12.4%	11.3%	11.2%	9.6%	11.4%
8 Chronic Pain (2000/01)																	
Per cent said 'no' when asked it they were usually free of pain or discomfort.	22.3%	22.2%	19.7%	17.6%	20.1%	18.7%	16.5%	12.0%	13.0%	13.8%	18.4%	19.2%	20.5%	14.6%	17.6%	15.4%	17.0%
9 Mental Illness (2000/01)																	
Per cent with 'probable' and 'possible' risk of depression	12.9%	14.5%	11.9%	10.6%	14.8%	9.1%	12.0%	8.7%	10.6%	9.9%	14.1%	12.5%	18.7%	8.9%	13.8%	10.1%	11.6%
10 Infant Mortality (1998-2002)																	
Rate at per 1,000 live births	2.29	4.91	3.65	4.87	4.11	3.34	4.20	4.16	4.13	3.03	3.84	4.72	5.94	5.14	3.82	4.14	4.00
11 Potential Years of Life Lost Standardized Rate (PYLLSR) per 1,000 standard population (1998-2002)																	
Female	31.67	39.22	34.13	43.66	38.96	30.81	32.08	24.27	33.94	29.70	35.27	39.99	43.29	46.99	40.04	36.15	34.44
Male	59.21	68.72	61.92	78.85	66.70	52.64	55.96	37.62	67.69	46.87	58.18	66.13	77.73	78.86	71.64	65.68	60.65
Total	45.73	54.27	47.88	61.52	52.93	41.69	44.07	30.79	50.85	38.25	46.52	53.01	61.15	63.70	56.33	51.52	47.57
12 Life Expectancy (1997-2001)																	
Female	82.51	81.91	83.04	81.29	81.84	82.35	83.16	84.13	82.78	82.88	82.48	81.68	80.78	80.26	80.35	82.24	82.47
Male	78.04	76.30	77.99	75.77	76.72	77.09	78.54	79.22	76.13	78.62	77.86	76.84	75.85	75.45	75.39	76.35	77.30
Total	80.23	79.05	80.51	78.42	79.26	79.82	80.89	81.82	79.46	80.81	80.27	79.23	78.19	77.69	77.73	79.04	79.90

Notes and Sources

Population (2002)
Note: 2002 estimates of the population, benchmarked to the 2001 Census (PEOPLE 28). Projection for 2030 uses the PEOPLE 28 estimates for 2002 grown by the projected growth between 2002 and 2030 from PEOPLE 27.
Source: BC STATS, B.C. Ministry of Management Services.

Land Area in km²
Note: Data are rolled up from Local Health Areas (LHAs).
Source: Health Information Access Center, B.C. Ministry of Health Services.

1 **Self-rated health (2000/01)**
Note: Population age 12 years and over who rated their health as 'excellent'.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

2 **Positive mental health (2000/01)**
Note: Population age 12 years and over who have positive mental health, based on self-reported measures.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

3 **Functional Health (2000/01)**
Note: Population age 12 years and over who rated their functional health status as 'very good or perfect'.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

4 **Activity limitation (2000/01)**
Note: Population age 12 years and over who reported having a disability or handicap or being limited in certain activities on a continuing basis because of a health problem.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

5 **Disability-days (2000/01)**
Note: Population age 12 years and over who stayed in bed or cut down on normal activities because of illness or injury, one or more days in the past 2 weeks.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

6 **Overweight (2000/01)**
Note: Population age 20 to 64 years with a BMI (Canadian Standard) higher than 27.0.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

7 **Chronic Conditions (2000/01)**
Note: Population age 12 years and over who has reported being diagnosed with these conditions by a health professional.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 December).

8 **Chronic Pain (2000/01)**
Note: Population age 12 years and over who reported 'no' when asked if usually free of pain or discomfort.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

9 **Mental Illness (2000/01)**
Note: Population age 12 years and over who were considered at probable or possible risk of depression based on a list of questions.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

10 **Infant Mortality (1998-2002)**
Note: Death at age less than one year, annual average rate per 1,000 live births.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

11 **Potential Years of Life Lost Standardized Rate (PYLLSR) per 1,000 standard population (1998-2002)**
Note: Potential years of life lost (PYLL) from all causes, expressed as an age standardized rate per 1,000 standard population, annual average 1998-2002.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

12 **Life Expectancy (1997-2001)**
Note: Life expectancy at birth (years), 1997-2001.
Source: BC STATS, B.C. Ministry of Management Services.

Goal 1: Living and Working Conditions

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
13 Unemployment rate (2001)	9.7%	11.1%	9.6%	12.0%	8.6%	7.3%	6.6%	7.2%	8.3%	6.5%	7.0%	11.4%	12.5%	15.3%	12.2%	9.3%	8.5%
14 Workplace injuries (2002)	← No regional data →																3.2%
15 Decision-latitude at work	← No regional, provincial or recent trend data →																
16 Low income rate (2001)	← No regional data →																12.1%
17 Income Assistance Rates (2002, July) Per cent of population	4.3%	6.2%	5.3%	6.1%	5.4%	4.1%	4.2%	2.1%	6.1%	2.7%	5.0%	7.4%	6.5%	7.7%	7.4%	4.3%	5.0%
18 Income inequality (2001)	23.1%	22.0%	22.5%	22.1%	23.1%	21.9%	23.2%	21.9%	17.5%	19.3%	22.4%	22.4%	22.9%	22.4%	22.3%	23.8%	21.2%
19 Social Support (2000/01) Per cent reported 'high'	83.4%	80.5%	80.8%	81.4%	78.4%	77.5%	81.9%	69.6%	67.6%	80.9%	83.8%	78.8%	74.0%	76.0%	79.6%	82.2%	78.0%
20 Volunteer rate (2000) Per cent volunteered	← No regional data →																26.0%
21 Crime rate per 1,000 population (1999-2001)																	
Person	11.8	9.3	10.7	15.1	13.2	11.4	12.5	6.5	11.8	11.3	11.9	12.3	19.4	23.2	17.4	21.0	12.5
Property	46.2	34.1	55.7	54.0	62.8	71.7	70.5	52.4	103.3	49.2	55.5	55.1	63.3	42.2	55.6	47.3	55.4
Other	39.2	34.2	37.4	43.0	40.3	33.4	32.3	25.5	23.2	34.9	38.7	44.9	49.2	63.0	56.7	65.6	36.6
Total	97.2	77.7	103.8	112.0	116.3	116.6	115.2	84.4	138.4	95.4	106.0	112.3	131.9	128.4	129.7	133.8	114.5
22 Children and youth in care (December 2002) Number of children per 1,000 age 0 to 18 years	6.6	11.5	17.8	14.6	6.4	7.4	4.0	10.3	5.9	11.9	12.7	16.3	14.5	14.3	12.9	10.2	10.3
23 Housing need	← No regional, provincial or recent trend data →																

Notes and Sources

13 **Unemployment rate (2001)**
Note: Proportion of the labour force age 15 years or more who did not have a job (available for work and seeking work) during Census week (May 2001).
Source: Statistics Canada. 2001 Census special tabulation. Prepared by BC STATS, B.C. Ministry of Management Services.

14 **Workplace injuries (2002)**
Note: Injury rate is the number of claims per 100 estimated person-years of employment, including claims for short term or long term disability or survivor benefits in the year of the injury or in the first quarter of the year following the year of injury.
Source: Workers' Compensation Board of British Columbia.

15 **Decision-latitude at work:** No notes.

16 **Low income rate (2001)**
Note: Proportion of the population in Low Income After Tax.
Source: Statistic Canada. *Income in Canada 2001*. Catalogue No.75-202-XIE.

17 **Income Assistance Rates (2002, July)**
Note: Proportion of the population receiving British Columbia Employment Assistance, the provincial government program that provides financial assistance to individuals and families in need for July, 2002.
Source: Economic Analysis Branch, B.C. Ministry of Human Resources.

18 **Income inequality (2001)**
Note: The income share of the bottom half (poorest) families. That is, the proportion of the population's household income that accrues to households earning less than the median income.
Source: Statistics Canada. Data prepared by Health Analysis and Measurement Group using data from 2001 Census, special tabulations.

19 **Social Support (2000/01)**
Note: Proportion of the population age 12 years and over who report a high level of social support, based on their responses to four questions.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

20 **Volunteer rate (2000)**
Note: Proportion of the population age 15 years and over who report having participated in volunteer activities in the past year.
Source: Statistics Canada. *2000 National Survey of Giving, Volunteering, and Participating.*

21 **Crime rate per 1,000 population (1999-2001)**
Note: Rate per 1,000 population. Person crimes include the violent crimes of homicide, attempted murder, sexual and non-sexual assault, robbery, and abduction. Property crimes include break and enter, motor vehicle theft, fraud and possession of stolen property. Other crimes include prostitution, possession of offensive weapons, arson etc. and any other Criminal Code offence not covered by a specific Uniform Crime Reporting offence category.
Source: Police Services Division, B.C. Ministry of Public Safety and Solicitor General. Prepared by BC STATS, B.C. Ministry of Management Services.

22 **Children and youth in care (December 2002)**
Note: Number of children who are in the care of child welfare authorities, as a proportion of the total child population age 0 to 18.
Source: B.C. Minsitry of Children and Family Development. Prepared by BC STATS, B.C. Ministry of Management Services.

23 **Housing need:** No notes.

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
24 Low birthweight (1998-2002) Per cent of live births	3.4	5.1	5.2	5.5	4.7	5.3	5.4	5.0	5.4	4.2	5.0	4.4	4.9	4.4	4.9	4.1	5.0
25 Breastfeeding (1998/99)	← No regional data →																73.1%
26 Family functioning (1998/99)	← No regional data →																89.4%
27 School readiness (1998/99)	← No regional data →																83.7%
28 High school graduation (2001) Per cent age 25 to 64 years with high school or greater	76.3%	79.5%	78.0%	74.9%	74.4%	83.9%	79.1%	83.6%	83.5%	88.0%	85.0%	78.4%	73.9%	73.1%	73.1%	70.8%	80.6%
29 Post-secondary graduation (2001) Per cent age 25 to 64 years with high school or greater	52.6%	55.6%	53.4%	49.9%	48.2%	59.2%	52.7%	58.9%	63.1%	65.8%	61.4%	53.5%	47.8%	47.1%	46.1%	46.5%	56.4%
30 Grad 12 exam completion (2001/02)	← No regional data →																77.0%
31 Smoking (2000/01) Per cent of current smokers	26.3%	24.9%	22.9%	23.4%	25.0%	19.0%	16.3%	13.6%	20.0%	17.1%	19.9%	23.0%	21.7%	25.3%	29.9%	26.6%	20.5%
32 Regular heavy drinking (2000/01) Per cent with 5 or more drinks	26.1%	22.6%	19.5%	22.3%	22.8%	12.9%	18.2%	14.7%	19.3%	19.7%	20.2%	20.8%	25.3%	23.8%	25.9%	27.1%	19.5%
33 Physical Activity (2000/01) Per cent physically active	35.8%	34.9%	26.5%	28.1%	29.3%	21.5%	24.2%	22.6%	25.0%	29.0%	32.4%	32.6%	32.3%	31.0%	26.4%	27.3%	26.9%
34 Healthy eating (2000/01) Per cent consume fruits and vegetables 5 or times per day	37.6%	41.1%	38.2%	33.5%	36.5%	32.7%	37.6%	34.2%	34.6%	46.5%	44.9%	42.7%	39.5%	40.1%	35.6%	31.4%	37.7%
35 Bicycle helmet use	← No regional, provincial or recent trend data →																
36 High-risk sexual practices	← No regional, provincial or recent trend data →																
37 Teen pregnancy rates (1993-2001) Per 1,000 female population	37.9	36.2	41.1	49.1	47.3	37.3	37.1	25.3	35.3	33.1	46.5	55.4	68.7	67.1	56.8	66.4	43.0
38 Living arrangements, 65 years and over (2001) Per cent in collective dwellings	4.8%	5.9%	4.6%	3.7%	5.6%	7.3%	5.0%	3.9%	6.8%	4.6%	6.5%	4.6%	3.7%	4.3%	4.7%	5.8%	5.5%

Notes and Sources

24 Low birthweight (1998-2002)
Note: Live births with a birthweight less than 2,500 grams, as a percent of live births, annual average 1998-2002.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

25 Breastfeeding (1998/99)
Note: Proportion of infants age 3 months to 3 years who are currently being breastfed or who were breastfed for at least 3 months.
Source: Statistics Canada. National Longitudinal Survey of Children and Youth, 1998/99. Prepared using data from B.C. Ministry of Children and Family Development.

26 Family functioning (1998/99)
Note: Proportion of children living in 'healthy functioning' families, as determined by a series of questions about how well the family works together.
Source: Statistics Canada. National Longitudinal Survey of Children and Youth, 1998/99. Prepared using data from B.C. Ministry of Children and Family Development.

27 School readiness (1998/99)
Note: Proportion of children who are 'ready for school', based on the Peabody Picture Vocabulary Test.
Source: Statistics Canada. National Longitudinal Survey of Children and Youth, 1998/99. Prepared using data from B.C. Ministry of Children and Family Development.

28&29 High school/Post secondary graduation (2001)
Note: Proportion of the population age 25 to 64 years who have a high school graduation certificate or higher and the proportion who have a post-secondary certificate, diploma, or degree of some type, based on the Census questions about educational attainment.
Source: Statistics Canada. 2001 Census special tabulation. Prepared by BC STATS, B.C. Ministry of Management Services.

30 Grad 12 exam completion (2001/02)
Note: Proportion of Grade 8 students who completed their secondary education within six years and received a Dogwood Diploma.
Source: Data Analysis and Reporting, B.C. Ministry of Education.

31 Smoking (2000/01)
Note: Population age 12 years and over, who smoke daily or on an occasional basis.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

32 Regular heavy drinking (2000/01)
Note: Population age 12 years and over, who reported drinking 5 or more drinks on occasion, 12 or more times a year.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

33 Physical Activity (2000/01)
Note: Population age 12 years and over who are physically active, based on their responses to questions about the frequency, duration, intensity of their participation in leisure-time physical activity.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 December).

34 Healthy eating (2000/01)
Note: Population age 12 years and over who consume fruits and vegetables 5 or more times per day.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

35 Bicycle helmet use: No notes.

36 High-risk sexual practices: No notes.

37 Teen pregnancy rates (1993-2001)
Note: Pregnancy rates per 1,000 females, age 15 to 19 years. Pregnancies include live births, stillbirths, induced abortions and miscarriages resulting in hospitalization.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

38 Living arrangements, 65 years and over (2001)
Note: Population age 65 years and over who lived in collective dwellings.
Source: Statistics Canada. 2001 Census. Prepared by BC STATS, B.C. Ministry of Management Services.

GOAL 3: PHYSICAL ENVIRONMENT

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
39 PM_{10} air pollution	No regional data as monitoring sites are in communities and data do not necessary reflect average air quality in B.C.																
40 Exposure to second-hand smoke (2000/01) Per cent of non-smokers exposed to second-hand smoke	30.3%	21.4%	18.5%	24.1%	23.2%	17.4%	21.0%	18.7%	19.1%	15.4%	16.5%	18.8%	-	23.0%	26.2%	32.3%	19.8%
41 Water quality index	No regional data as monitoring sites are in communities and data do not necessary reflect average water quality in B.C.																
42 Boil-water advisories (2002)	No regional data																338
43 Critical hazards in food premises (2000/01)	No regional data																3.0%
44 Food quality samples meeting guidelines (2002)	No regional data																69.0%
45 Blood lead levels in children (2000-2002)	No regional data. This indicator only measures blood lead levels of children in the community of Trail, of which about 7 per cent continue to have higher than 15μg/d.																
46 Greenhouse gas emissions (1999)	No regional data																63.5
47 Energy consumption (1999)	No regional data																230.6
48 Land in protected areas (2001)	No regional data																12.5%

Notes and Sources

39 PM_{10} air pollution: No notes.

40 Exposure to second-hand smoke (2000/01)
Note: Non-smoking population age 12 years and over, who were exposed to second-hand smoke on most days in the month preceding the survey.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

41 Water quality index: No notes.

42 Boil-water advisories (2002)
Note: The number of boil-water advisories in place at a given point in time.
Source: Public Health Protection Branch, B.C. Ministry of Health Services. Data prepared using the Health Data Warehouse (2003 April), B.C. Ministry of Health Planning and B.C. Ministry of Health Services.

43 Critical hazards in food premises (2000/01)
Note: Proportion of inspected food facilities, as part of the routine, complaint or follow up process, rated as 'high' in critical hazard.
Source: Business Planning, Surveillance and Epidemiology. B.C. Ministry of Health Planning.

44 Food quality samples meeting guidelines (2002)
Note: Proportion of food samples for cooked ready-to-eat foods that meet guidelines for bacteria and sanitary quality.
Source: B.C. Centre for Disease Control.

45 Blood lead levels in children (2000-2002)
Note: Average blood lead levels in children age less than 3 years and the percentage of children with levels above the Trial Lead Program 'level of concern' (15μg/dl or higher), annual average 2000-2002.
Source: Trail Lead Program.

46 Greenhouse gas emissions (1999)
Note: Measured in megatonnes of carbon dioxide equivalent.
Source: Air Resources Branch, B.C. Ministry of Land, Water and Air Protection.

47 Energy consumption (1999)
Note: Per capita energy consumed (in gigajoules).
Source: B.C. Ministry of Land, Water and Air Protection. Per capita data prepared using population estimates from the Health Data Warehouse, (April, 2003), B.C. Ministry of Health Planning and B.C. Ministry of Health Services.

48 Land in protected areas (2001)
Note: Areas protected, as a per cent of British Columbia's land base.
Source: B.C. Ministry of Land, Water and Air Protection.

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
49 Childhood immunization for 2-year olds (2002)																	
Diphtheria/Tetanus/Pertussis/Polio	72.5%	77.3%	83.7%	87.5%	66.7%	-	-	-	-	89.1%	89.4%	84.0%	73.9%	76.0%	86.7%	77.1%	81.1%
Measles/Mumps/Rubella	76.5%	75.0%	84.1%	85.8%	64.2%	-	-	-	-	89.1%	89.1%	84.7%	76.1%	74.7%	84.2%	75.7%	80.5%
Haemophilus influenzae Type B	74.5%	79.5%	85.3%	88.3%	66.7%	-	-	-	-	89.1%	89.4%	84.0%	73.9%	76.0%	86.7%	80.0%	81.7%
50 Influenza immunization (2002/03)																	
Seniors	64.6%	57.0%	67.4%	69.7%	54.3%	84.5%	57.8%	71.4%	111.5%	70.7%	55.3%	68.7%	69.1%	64.1%	67.5%	63.3%	70.9%
Residents of care facilities	89.0%	86.0%	85.0%	94.0%	90.0%	73.0%	89.0%	97.0%	90.0%	73.0%	80.0%	89.0%	88.0%	99.0%	93.0%	83.0%	85.0%
Health care workers	51.0%	39.0%	52.0%	62.0%	59.0%	52.0%	45.0%	61.0%	58.0%	60.0%	99.0%	62.0%	47.0%	-	46.0%	-	56.0%
51 Screening mammography (2000 and 2001)	← No regional data →																49.0%
52 Pap smears (July 1999 to December 2001)																	
Participation rates age 20 to 69	55.4%	62.3%	60.6%	55.4%	54.1%	58.1%	56.9%	56.0%	70.0%	65.9%	66.1%	60.2%	58.9%	56.9%	54.9%	55.3%	61.5%
53 Smoking cessation services (2001)	← No regional data →																44.0%
54 Dental visits in past year (2000/01)																	
Per cent who had contact with dental professionals	57.1%	59.2%	61.8%	56.8%	58.3%	65.0%	64.1%	65.2%	63.4%	70.6%	68.5%	62.8%	61.0%	65.2%	62.3%	51.0%	63.4%
55 Unmet health care needs (2000/01)																	
Per cent who said they did not receive needed health care	13.6%	13.9%	13.4%	12.0%	15.0%	10.3%	10.8%	8.7%	10.8%	11.5%	13.6%	14.9%	13.2%	15.0%	13.5%	15.7%	12.1%
56 Opportunities for self-care (2001/02)																	
GP Office Visits for Time-Limited Acute Symptoms (TLAS)	1,233.4	1,006.3	1,334	1,101	1,292	1,233	1,368	1,257	1,291	1,274	1,269	1,264	1,084	1,100	1,032	1,059	1,268
Emergency room (ER) visits for non-urgent conditions	4.3	12.9	44.0	81.4	83.1	65.7	65.9	48.0	41.4	57.4	67.7	66.6	82.5	12.0	104.1	6.5	59.3
57 Use of protocols and guidelines (2001/02)	← No regional data →																$7.2 M
58 Breast-conserving surgery (2001/02) **																	
Per cent of all breast cancer surgeries	39.6%	43.8%	58.4%	68.7%	47.8%	54.1%	59.6%	62.2%	63.9%	71.9%	68.5%	61.1%	62.1%	50.0%	60.8%	17.6%	60.1%
59 Caesarean deliveries (1998-2002)																	
Per cent of live births	19.2%	21.9%	22.7%	26.9%	22.9%	23.1%	24.7%	25.9%	24.3%	23.7%	25.9%	23.9%	22.9%	24.4%	24.0%	21.4%	24.0%
60 Antibiotic prescribing (2001/02)																	
Proportion of patients (age 0 to 14 years) seen by GP and diagnosed with ear infection	11.8%	12.9%	15.7%	15.0%	18.0%	14.1%	15.7%	9.8%	9.2%	14.1%	16.8%	15.5%	17.1%	16.7%	16.1%	13.6%	14.5%
Proportion prescribed first line antibiotics	54.0%	51.9%	62.4%	54.0%	62.5%	56.6%	57.8%	56.3%	50.4%	55.6%	53.9%	53.1%	60.7%	54.9%	58.5%	58.4%	56.8%
61 Preventable admissions to hospitals (2001/02) **																	
Cases per 1,000 population (age standardized)	5.3	5.2	3.6	4.0	3.8	2.4	2.5	1.9	3.0	2.8	3.4	3.8	5.9	7.1	4.4	6.3	3.4
62 May not require hospitalizations (2000/01)																	
Cases per 1,000 population (age standardized)	11.8	13.5	7.1	9.6	7.9	5.3	5.2	5.6	4.5	5.6	8.3	8.3	11.4	10.2	9.0	11.3	6.9
63 Expected length of stay compared to actual stay (2001/02)**																	
Expected	4.25	4.41	5.20	4.86	4.65	4.76	4.89	4.71	5.28	5.09	5.29	4.87	4.12	4.16	4.41	4.00	4.89
Actual	3.92	4.15	4.67	4.52	4.19	4.58	4.78	4.51	5.39	4.89	5.30	4.82	3.85	3.75	4.24	3.94	4.71
Expected minus actual	0.33	0.26	0.53	0.34	0.46	0.18	0.11	0.20	(0.11)	0.20	(0.01)	0.05	0.27	0.41	0.17	0.06	0.18
64 Alternate level of care (ALC) days (2001/02)																	
Per cent of ALC	13.5%	13.9%	9.8%	13.2%	14.5%	18.5%	17.9%	22.2%	14.7%	12.6%	13.3%	11.0%	22.3%	18.5%	11.3%	9.9%	14.8%
65 Community follow-up after hospitalization (2001/02)																	
Per cent follow-up	72.4%	76.5%	75.1%	72.1%	75.6%	70.7%	77.5%	70.0%	66.9%	71.7%	74.2%	76.1%	61.0%	69.3%	73.8%	71.0%	72.6%
66 Deaths due to medically-treatable diseases (1998-2002)																	
Males	8	9	12	13	18	41	51	5	60	18	18	10	5	6	20	5	299
Females	8	4	18	27	28	36	48	9	45	30	38	25	6	7	13	8	350
Total	16	13	30	40	46	77	99	14	105	48	56	35	11	13	33	13	649

Notes and Sources

49 Childhood immunization for 2-year olds (2002)
Note: Data are submitted by Health Authorities based on an audit of Child Health Records.
Source: Prevention and Wellness Planning Division (2003 July), B.C. Ministry of Health Planning. Unpublished data.

50 Influenza immunization (2002/03)
Note: Proportion of population age 65 years and over, residents, health care workers respectively who received influenza vaccinations. Rate for Vancouver HSDA is greater than 100% likely because they also immunized residents from other HSDAs.
Source: Prevention and Wellness Planning Division (2003 August), B.C. Ministry of Health Planning. Unpublished data.

51 Screening mammography (2000 and 2001)
Note: Proportion of women age 50 to 74 years who attended the Screening Mammography Program of B.C. at least once in the past two years.
Source: BC Cancer Agency. *2001/2002 Annual Report, Screening Mammography Program*. Population data in the report was prepared using Health Data Warehouse, B.C. Ministry of Health Services and BC STATS, B.C. Ministry of Management Services.

52 Pap smears (July 1999 to December 2001)
Note: Proportion of women, age 20 to 69 years who had had a Pap test within the last 20 months.
Source: BC Cancer Agency. *2002 Annual Report, Cervical Cancer Screening Program*. Population data in the report was prepared using Health Data Warehouse, B.C. Ministry of Health Services and BC STATS, B.C. Ministry of Management Services.

53 Smoking cessation services (2001)
Note: Proportion of family physicians who actively counsel their patients to stop smoking, as evidenced by their participation in the BC Doctors' Stop-Smoking Program.
Source: B.C. Doctors' Stop Smoking Program.

54 Dental visits in past year (2000/01)
Note: Population age 12 years and over who had contact with dental professionals in past 12 months.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

55 Unmet health care needs (2000/01)
Note: Population age 12 years and over who said they had at least one unmet health-care need during the previous year.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

56 Opportunities for self-care (2001/02)
Note: Age standardized rate per 1,000 population. TLAS are common illnesses and symptoms that are considered appropriate for self or home care. Conditions and diagnostic codes are based on the Department of Public Health and Preventative Medicine of the Oregon Health Sciences University. ER non-urgent visits refer to Level 1 emergency room services.
Source: Health Information Access Centre, B.C. Ministry of Health Services. Prepared using claims data from Medical Services Plan.

57 Use of protocols and guidelines (2001/02)
Note: Estimated difference between actual utilization and projected utilization of fee items for which protocols and guidelines have been adopted by the Guidelines and Protocols Steering Committee.
Source: Medical Services Plan, Medical and Pharmaceutical Services, B.C. Ministry of Health Services.

58 Breast-conserving surgery (2001/02) **
Note: Proportion of female breast cancer surgery patients (ICD-9 diagnosis code of 174, acute, rehab, and day surgery levels of care) who receive breast-conserving surgery.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

59 Caesarean deliveries (1998-2002)
Note: Proportion of live births that are delivered by caesarean section.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

60 Antibiotic prescribing (2001/02)
Note: Proportion of children age 0 to 14 years diagnosed with otitis media (ICD-9 381-382) who received a prescription for antibiotics after visiting a general practitioner and, of those who received a prescription, the proportion who received the first-line antibiotic recommended in the anti-infective guidelines.
Source: Health Information Access Centre, B.C. Ministry of Health Services. Prepared using data from Medical Services Plan and PharmaNet.

61 Preventable admissions to hospitals (2001/02) **
Note: Hospitalizations for 'ambulatory care sensitive conditions' where hospital admission is usually not needed, if patients have timely access to high quality care in the community, expressed in cases per 1,000 population, age standardized.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

62 May not require hospitalizations (2000/01)
Note: Hospitalizations classified as 'May Not Require Hospitalization' (MNRH), expressed in cases per 1,000 population, age standardized.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

63 Expected compared to actual stay (2001/02) **
Note: Average days that acute care patients spend in hospital, compared to expected length of stay (based on patient's diagnosis, age and other factors). Positive differences between expected and actual means efficiences were achieved, provided patients remained healthy after discharge.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

64 Alternate level of care (ALC) days (2001/02)
Note: Number of days that Alternate Level of Care patients spend in acute care hospitals, as a proportion of all inpatient hospital-days.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

65 Community follow-up after hospitalization (2001/02)
Note: Proportion of persons, age 15 to 64 years, hospitalized for a mental health diagnosis who receive at least one contact with a community mental health centre or a fee-for-service psychiatrist or general practitioner within 30 days of discharge.
Source: Information Support, B.C. Ministry of Health Services. Prepared using several data sources - Mental Health Data Warehouse, claims data from the Medical Services Plan and Morbidity Database.

66 Deaths due to medically-treatable diseases (1998-2002)
Note: Deaths due to medically-treatable diseases according to Charlton's definition, which is based on mortality, in specific age groups, that could potentially be avoided through appropriate medical attention.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

** 2001/02 data for these indicators are based on ICD10 coding. Data for previous years were based on ICD9 coding. Necessary steps were taken to present 2001/02 data by translating ICD10 to ICD9 and minimizing differences where translation may not be exact.

GOAL 5: ABORIGINAL HEALTH

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
67 Self-rated health (2000/01)																	
Per cent rated 'Excellent'	← No regional data →																16.0%
Per cent rated 'Very Good'	← No regional data →																29.7%
Per cent rated 'Good'	← No regional data →																35.6%
Per cent rated 'Fair' or 'Poor'	← No regional data →																18.7%
68 Infant Mortality Rate for Status Indian (1991-2001) Rate per 1,000 live births	← 9.2 →		5.5	6.2	9.5	7.1	6.0	-	12.0	7.4	14.6	11.9	16.9	8.2	8.0	7.5	9.3
69 Potential Years of Life Lost for Status Indians (1991-2001)																	
Males	← 204.0 →		166.1	159.0	172.4	266.4	216.8	178.9	292.1	158.4	187.5	169.5	180.8	120.5	169.6	137.0	176.8
Females	← 91.4 →		77.3	92.9	91.8	142.6	105.3	95.4	200.6	88.8	101.9	114.6	96.2	67.9	112.0	96.1	104.5
70 Life expectancy for Status Indians (1997-2001)																	
Males	← 64.7 →		69.2	70.5	70.9	62.4	67.8	65.8	65.3	70.9	69.6	70.4	65.6	74.7	71.2	72.3	69.9
Females	← 72.7 →		77.7	76.2	77.8	68.4	73.1	70.4	72.0	76.6	73.9	75.3	77.0	77.5	75.1	76.0	75.4
71 High school completion rate (2001)	← No regional data →																56.4
72 Unemployment rate (2001)	← No regional data →																22.5
73 Low income rate (2001)	← No regional data →																39.7
74 Community control	← Data are no longer collected the same way but other measures show that community control is improving →																

Notes and Sources

67 Self-rated health (2000/01)

Note: Proportion age 12 years and over who identify with an Aboriginal group, who rate their health status as 'excellent', 'very good', 'good' and 'fair/poor'.

Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

68 Infant Mortality Rate for Status Indian (1991-2001)

Note: HSDAs with less that 3 cases are not shown.

Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

69 Potential Years of Life Lost for Status Indians (1991-2001)

Note: Potential years of life lost per 1,000 Status Indian population (based on Canada Census 1991 as standard population)

Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

70 Life expectancy for Status Indians (1997-2001)

Note: Life expectancy at birth (years), 1997-2001.

Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

71 High school completion rate (2001)

Note: Proportion of the population age 15 years and over who have a high school graduation certificate or higher, based on the Census questions about educational attainment, for the Aboriginal population on-reserve and off-reserve.

Source: Statistics Canada. 2001 Census.

72 Unemployment rate (2001)

Note: Portion of the labour force, age 15 years and over, who did not have a job during the reference period, for the Aboriginal population on-reserve, off-reserve, and total, compared to non-Aboriginal B.C. population.

Source: Statistics Canada. 2001 Census.

73 Low income rate (2001)

Note: Portion of the Aboriginal population, age 15 years and over, with total income below $10,000, on-reserve, and total, compared to the non-Aboriginal B.C. population.

Source: Statistics Canada. 2001 Census.

74 Community control: No notes.

GOAL 6: DISEASE AND INJURY PREVENTION

Indicators	(11) East Kootenay	(12) Kootenay Boundary	(13) Okanagan	(14) Thompson Cariboo	(21) Fraser Valley	(22) Simon Fraser	(23) South Fraser	(31) Richmond	(32) Vancouver	(33) North Shore/Coast Garibaldi	(41) South Vancouver Island	(42) Central Vancouver Island	(43) North Vancouver Island	(51) Northwest	(52) Northern Interior	(53) Northeast	British Columbia
75 Heart disease and stroke deaths (1998-2002)																	
Ischemic heart diseases (I20-I25)	9.1	11.4	8.6	10.0	11.1	10.6	10.1	8.5	9.3	8.7	8.5	10.3	8.9	9.9	10.0	12.6	9.6
Cerebrovascular diseases/Stroke (I60-I69)	3.9	3.6	4.0	4.7	4.0	4.7	4.1	4.0	4.6	4.6	4.2	4.5	5.2	5.2	5.5	3.5	4.3
Diseases of the circulatory system (I00-I99)	19.1	20.6	18.2	22.0	20.4	20.6	18.5	16.5	18.6	18.0	17.9	20.1	20.5	23.6	22.1	22.3	19.2
76 Cancer incidence and mortality (1998-2002)																	
All cancers (C00-C97)	16.5	16.2	16.0	16.6	16.8	16.5	15.5	13.8	15.2	15.1	16.7	16.7	17.7	16.7	19.5	16.5	16.1
Trachea and lung (C33-C34)	5.0	4.3	4.2	4.6	4.4	4.5	3.9	3.9	4.1	3.7	4.2	4.2	6.0	4.2	5.7	5.3	4.2
Female breast (C500-C509)	2.3	1.6	2.2	2.3	2.4	2.4	2.2	1.9	2.0	2.5	2.6	2.1	2.1	2.3	2.6	2.4	2.3
Prostate (C61)	2.6	2.7	2.5	2.5	2.7	2.3	2.6	1.5	1.9	2.4	2.5	2.7	1.8	2.1	3.3	3.8	2.4
77 Respiratory disease deaths (1998-2002)																	
Disease of the respiratory system (J00-J98)	5.6	5.2	5.4	6.5	5.9	6.1	4.9	5.0	6.0	5.9	5.3	5.4	5.4	8.5	7.8	7.1	5.7
78 Mental health hospitalizations (2001/02)																	
Cases per 1,000 population	7.6	8.9	6.9	6.9	6.9	4.5	4.2	3.4	5.8	4.6	7.0	6.2	6.5	10.3	6.5	8.7	6.0
79 Neural tube defects (1997-2001)																	
Rate per 1,000 total births (live births and stillbirths).	0.8	0.6	0.4	0.9	0.7	0.4	0.5	0.2	0.2	0.3	0.4	0.7	-	0.9	0.4	0.7	0.5
80 Vaccine-preventable diseases (2002)																	
Invasive Haemophilus Influenzae Type b	0.0	1.3	0.0	0.0	0.8	0.2	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Hepatitis B : Acute	3.8	2.5	1.0	0.9	2.8	1.1	2.1	1.1	2.0	1.1	1.5	2.9	9.0	3.6	0.0	0.0	1.8
Hepatitis B : Chronic	0.0	1.3	5.1	6.1	12.7	80.5	40.4	198.8	185.6	3.0	4.2	11.2	9.0	6.0	2.0	3.2	54.7
Hepatitis B : Undetermined	1.3	5.0	0.6	0.5	1.6	13.2	1.6	1.1	0.0	16.4	14.9	0.8	0.0	9.6	0.0	6.3	5.2
Pertussis	30.4	27.5	6.4	8.9	45.3	3.1	36.3	2.9	2.0	21.9	9.9	10.0	9.0	26.5	23.3	1.6	15.5
Other Communicable Diseases (2002)																	
Hepatitis C	76.1	80.1	99.4	93.9	193.4	124.8	80.7	57.7	164.5	82.6	103.5	108.9	156.8	101.0	84.5	77.3	111.9
Invasive Pneumococcal	6.3	8.8	7.3	8.4	9.9	6.9	6.0	8.6	13.3	6.0	11.9	4.2	3.6	0.0	12.6	3.2	8.3
Methicillin Resistant Staphylococcus Aureus	3.8	15.0	15.2	25.7	19.9	11.6	37.8	48.0	0.3	27.2	18.1	16.6	18.0	33.7	23.3	15.8	19.8
81 Tuberculosis (2002)																	
Rate per 100,000 population	1.2	1.3	1.3	0.5	2.8	8.0	7.2	13.2	21.6	4.1	3.0	2.9	12.5	5.9	4.6	1.5	7.3
82 HIV infection (2002)																	
Rate per 100,000 population	1.3	0	4.1	2.3	5.2	9.1	4.6	4.6	42.7	2.6	9.2	0	32.4	0	6	1.6	10.7
83 Sexually transmitted diseases (2002)																	
Chlamydia, rate per 100,000 population	161.0	143.9	171.2	249.3	107.2	155.2	112.4	146.8	274.1	184.5	171.2	195.0	335.2	288.7	257.0	277.7	185.0
Gonorrhea, rate per 100,000 population	0.0	5.0	2.9	4.2	6.0	13.1	8.0	12.0	69.8	10.8	8.2	5.4	10.8	4.8	10.7	28.4	17.2
Syphillis, rate per 100,000 population	0.0	0.0	1.0	0.0	1.2	5.6	2.3	1.7	21.6	1.1	0.0	0.4	0.0	0.0	0.7	0.0	4.5
84 Enteric, food and waterborne diseases (2002)																	
Amebiasis	0.0	7.5	1.0	0.9	6.7	7.3	9.0	1.1	34.5	4.1	5.0	2.1	0.0	0.0	0.0	0.0	8.8
Campylobacteriosis	19.0	33.8	31.1	26.6	46.9	57.1	52.6	70.8	64.2	72.2	57.8	42.4	48.7	10.8	15.3	3.2	49.5
Cryptosporidiosis	2.5	0.0	1.3	1.9	9.1	2.9	2.8	2.3	3.1	4.8	2.7	2.5	1.8	0.0	0.0	12.6	3.1
Verotoxigenic E.coli	8.9	3.8	4.4	4.2	5.6	4.7	4.6	1.7	3.4	0.4	1.5	2.1	0.0	0.0	2.7	0.0	3.4
Giardiasis	10.1	28.8	12.4	8.4	19.5	11.4	16.8	6.9	38.9	18.2	14.1	12.5	14.4	2.4	8.0	3.2	17.0
Hepatitis A	1.3	2.5	1.3	0.5	2.0	0.7	1.1	1.1	3.9	4.1	1.2	0.8	3.6	2.4	2.0	9.5	1.9
Listeriosis	0.0	0.0	0.0	0.0	0.8	0.4	0.2	0.0	0.2	1.1	1.2	0.0	0.0	0.0	0.0	0.0	0.3
Salmonellosis	6.3	13.8	15.2	9.3	20.2	16.3	18.9	16.0	20.2	19.7	19.9	21.6	28.8	9.6	7.3	4.7	17.2
Shigellosis	1.3	1.3	0.6	0.9	5.6	2.0	5.4	6.3	11.7	3.3	3.0	1.7	0.0	0.0	1.3	0.0	4.1
Yersiniosis	13.9	6.3	3.5	0.9	2.8	8.0	7.0	29.7	26.0	38.3	30.0	16.6	7.2	0.0	2.0	3.2	14.5
85 Waterborne diseases outbreaks	← No outbreaks since 1999 →																
86 Unintentional injuries (1998-2002)																	
All ages	3.4	5.0	3.2	5.2	3.2	2.2	2.4	1.6	3.3	2.5	2.8	3.2	4.6	5.2	4.9	4.7	3.1
87 Hip fractures (2001/02)																	
Cases per 1,000 population, age 65 years and over	12.4	10.5	7.9	9.8	7.2	8.4	6.7	8.3	8.3	8.6	7.3	9.3	9.6	14.1	11.1	15.9	8.3
88 Domestic violence (1999-2001)	2.5	2.0	2.5	3.6	2.8	2.1	2.3	1.2	2.0	1.8	1.5	2.7	4.4	5.7	4.1	6.3	2.5
89 Child abuse and neglect (2002)																	
Number of children per 1,000 population age 0 to 18 years	18.6	9.5	10.1	19.4	6.8	7.6	4.4	2.9	6.6	10.0	11.9	9.4	24.9	23.8	25.4	10.7	10.0
90 Illicit drug overdose (2002)	← No regional data →																4.88
91 Suicide (1998-2002)	1.37	1.28	1.21	1.35	1.03	0.88	0.85	0.59	1.08	0.92	1.16	1.31	1.31	1.63	1.12	0.76	1.05

Notes and Sources

75 Heart disease and stroke deaths (1998-2002)
Note: Age standardized mortality rate per 10,000 population, annual 5-year average for 1998-2002. Data are based on the new ICD-10 mortality coding.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

76 Cancer incidence and mortality (1998-2002)
Note: Age standardized mortality rate per 10,000 population, annual 5-year average for 1998-2002. Data are based on the new ICD-10 mortality coding.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

77 Respiratory disease deaths (1998-2002)
Note: Age standardized mortality rate per 10,000 population, annual 5-year average for 1998-2002. Data are based on the new ICD-10 mortality coding.
Source: B.C. Vital Statistics Agency, BC Ministry of Health Planning.

78 Mental health hospitalizations (2001/02)
Note: The number of hospital admissions due to mental disorders (ICD-9 290-319 where principal diagnosis is acute care), expressed as a rate per 1,000 population.
Source: Information Support, B.C. Ministry of Health Services. Prepared using Discharge Abstract Database.

79 Neural tube defects (1997-2001)
Note: Rate per 1,000 total births (live births and stillbirths).
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning. Unpublished Tables.

80 Vaccine-preventable & other communicable diseases (2002)
Note: Rate per 100,000 population. Rates for Measles, Mumps and Rubella are available by HSDA but not reported as regional rates were all very low, none greater than 0.8 per 100,000 population.
Source: B.C. Centre for Disease Control.

81 Tuberculosis (2002)
Note: The number of active cases of tuberculosis (new active and reactivated) reported in a given time period, expressed as a rate per 100,000 population. Population estimates are from Health Data Warehouse.
Source: B.C. Centre for Disease Control.

82 HIV infection (2002)
Note: The number of persons who tested HIV-positive for the first time in a given year, expressed as a rate per 100,000 population.
Source: B.C. Centre for Disease Control.

83 Sexually transmitted diseases (2002)
Note: The number of new cases of chlamydia, gonorrhea, and infectious syphilis reported, expressed as a rate per 100,000 population.
Source: B.C. Centre for Disease Control.

84 Enteric, food and waterborne diseases (2002)
Note: Rates per 100,000 population. Rates were low for Typhoid Fever and Vibrio parahaemolyticus - South Fraser had the highest rate for Typhoid Fever at 1.6 per 100,000 and Richmond had the highest rate for Vibrio parahaemolyticus at 2.3 per 100,000 population.
Source: B.C. Centre for Disease Control.

85 Waterborne diseases outbreaks: No notes.

86 Unintentional injuries (1998-2002)
Note: Age standardized mortality rate per 10,000 population, annual 5-year average for 1998-2002.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

87 Hip fractures (2001/02)
Note: The number of hospitalizations for fracture of the hip (primary diagnosis of ICD-9 820.0-820.3, 820.8, 820.9), expressed as a rate per 1,000 population age 65 and older.
Source: Information Support, B.C. Ministry of Health Services. Prepared using Discharge Abstract Database

88 Domestic violence (1999-2001)
Note: The number of Criminal Code incidents that contain supplementary information indicating that a crime occurred against a spouse or an intimate partner, expressed as a rate per 1,000 population.
Source: Policy Services Division, B.C. Ministry of Public Safety and Solicitor General. Prepared by BC STATS, B.C. Ministry of Management Services.

89 Child abuse and neglect (2002)
Note: Number of children defined as in 'need of protection' by child welfare authorities per 1,000 children, age 0 to 18 years. This definition refers to the number of children, not the number of reports defined on page 218.
Source: B.C. Ministry of Children and Family Development. Prepared by BC STATS, B.C. Ministry of Management Services.

90 Illicit drug overdose (2002)
Note: The number of deaths due to illicit drug overdose, as determined by the B.C. Coroners Service, expressed as a rate per 100,000 population age 15 to 64 years.
Source: BC Coroners Service, B.C. Ministry of Public Safety and Solicitor General. Population estimates are from the BC STATS, B.C. Ministry of Management Services.

91 Suicide (1998-2002)
Note: Age standardized mortality rate per 10,000 population, annual 5-year average for 1998-2002. Data are based on the new ICD-10 mortality coding.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

APPENDIX E

Seniors Data

HEALTH STATUS
BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population: 12 years and older (except otherwise stated)
Population (2002)				
Female	148,589	157,860	306,449	(All ages) 2,088,181
Male	141,795	103,576	245,371	(All ages) 2,053,091
Total	290,384	261,436	551,820	(All ages) 4,141,272
Projection (2030)			1,315,400	(All ages) 5,773,181
1 Self-rated health (2000/01 Per cent rated 'excellent'	15.2%	9.1%	12.7%	24.2%
2 Positive mental health (2000/01) Per cent rated 'moderate' or 'high' for self-esteem	70.7%	63.3%	67.7%	69.8%
3 Functional Health (2000/01) Per cent rated 'Very good or perfect'	71.5%	49.1%	62.3%	78.9%
4 Activity limitation (2000/01) Per cent reported having a disability	34.4%	56.9%	43.7%	25.3%
5 Disability-days (2000/01) Per cent with 'disability days'	14.1%	16.8%	15.2%	18.2%
6 Overweight (1999) Both overweight and obese	(51-70 years) 62.1%	(71 years & over) 65.7%		-
7 Chronic Conditions (2000/01)				
Has arthritis	36.9%	47.2%	41.1%	14.5%
Has asthma	5.8%	6.4%	6.1%	7.6%
Has diabetes	11.8%	10.8%	11.4%	3.9%
Has high blood pressure	33.5%	37.2%	35.0%	11.4%
8 Chronic Pain (2000/01) Per cent said 'no' when asked it they were usually free of pain or discomfort.	23.6%	29.1%	25.8%	17.0%
9 Mental Illness (2000/01) Per cent with 'probable' and 'possible' risk of depression	6.4%	4.8%	5.7%	11.6%
10 Life expectancy (2002)				
Female			21.4	(At age 0) 83.2
Male			18.2	(At age 0) 78.2
Total			19.9	(At age 0) 80.7

Notes and Sources

Population (2002)
Note: Seniors population data are extracted from Health Data Warehouse (2003 April) and projections are from BC STATS, Population Section, P.E.O.P.L.E. Projection 28. See notes on page 221 for data on B.C. population.
Source: BC STATS, B.C. Ministry of Management Services.

1 **Self-rated health (2000/01)**
Note: Proportion who rated their health as 'excellent'.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

2 **Positive mental health (2000/01)**
Note: Proportion over who rated their self-esteem as 'moderate' or 'high'.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

3 **Functional Health (2000/01)**
Note: Proportion who rated their functional health status as 'very good or perfect'.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

4 **Activity limitation (2000/01)**
Note: Proportion who reported having a disability or handicap or being limited in certain activities on a continuing basis because of a health problem.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

5 **Disability-days (2000/01)**
Note: Proportion who stayed in bed or cut down on normal activities because of illness or injury, one or more days in the past 2 weeks.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

6 **Overweight (1999)**
Note: Population age (a) 51 to 70 years and (b) 71 years or over with a BMI of 25 and higher.
Source: B.C. Ministry of Health Planning. Prepared using B.C. Nutrition Survey (1999). Unpublished Report.

7 **Chronic Conditions (2000/01)**
Note: Proportion who reported being diagnosed with these conditions by a health professional.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 December).

8 **Chronic Pain (2000/01)**
Note: Proportion who reported 'no' when asked if usually free of pain or discomfort.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Share Files from Information Support, B.C. Ministry of Health Services.

9 **Mental Illness (2000/01)**
Note: Proportion who were considered at probable or possible risk of depression based on a list of questions.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

10 **Life Expectancy (2002)**
Note: Life expectancy at 65 years of age.
Source: BC STATS, B.C. Ministry of Management Services.

GOAL 1: LIVING AND WORKING CONDITIONS BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population
11 Employment and Unemployment Rates (2001)				
Employment rate	-	-	4.9%	(Age 15+) 59.6%
Unemployment rate	-	-	5.8%	(Age 15+) 8.5%
12 Low income rate (2001)				
Both	-	-	9.4%	(All ages) 12.1%
Female	-	-	10.2%	
Male	-	-	8.4%	
13 Income Assistance Rates (2001)				
Female	-	-	0.40%	(Age 15+) 5.5%
Male	-	-	0.45%	(Age 15+) 5.3%
14 Social Support (2000/01) High social support	72.9%	65.0%	69.7%	(Age 12+) 78%
15 Volunteer rate (2000) Per cent volunteered	-	-	15.0%	(Age 15+) 26%

GOAL 2: INDIVIDUAL CAPACITIES, SKILLS AND CHOICES BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population
16 High school graduation (2001) Per cent with high school or greater	-	-	50.6%	(Age 25 to 64+) 80.6%
17 Post-secondary graduation (2001) Per cent with post secondary or greater	-	-	32.9%	(Age 25 to 64+) 56.4%
18 Smoking (2000/01) Per cent of current smokers	11.0%	6.2%	9.0%	(Age 12+) 20.5%
19 Regular heavy drinking (2000/01) Per cent with 5 or more drinks	7.0%	-	5.5%	(Age 12+) 19.5%
20 Physical Activity (2000/01) Per cent physically active	24.4%	15.9%	20.9%	(Age 12+) 26.9%
21 Healthy eating (2000/01) Per cent consume fruits and vegetables 5 or times per day	43.4%	47.0%	44.9%	(Age 12+) 37.7%
22 Living arrangements, age 65+ (2001) Per cent, age 65+ in collective dwellings	1.3%	10.2%	5.5%	N/A

Notes and Sources

11 Employment and Unemployment Rates (2001)
Note: Proportion of the labour force by employment status during the reference period.
Source: Statistics Canada. Labour Force Suvey and 2001 Census.

12 Low income rate (2001)
Note: Proportion of the population in Low Income After Tax.
Source: Statistic Canada. *Income in Canada* 2001. Catalogue No.75-202-XIE.

13 Income Assistance Rates (2001)
Note: Proportion of the population receiving British Columbia Employment Assistance, the provincial government program that provides financial assistance to individuals and families in need.
Source: Economic Analysis Branch, B.C. Ministry of Human Resources.

14 Social Support (2000/01)
Note: Proportion who report a high level of social support, based on their responses to four questions .
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

15 Volunteer rate (2000)
Note: Proportion of the population who report having participated in volunteer activities in the past year.
Source: Statistics Canada. *Highlights of the 2000 National Survey of Giving, Volunteering, and Participating.*

16&17 High school/Post secondary graduation (2001)
Note: Proportion of the population who have a high school graduation certificate or higher and the proportion who have a post-secondary certificate, diploma, or degree of some type, based on the Census questions about educational attainment.
Source: Statistics Canada. 2001 Census special tabulation. Prepared by BC STATS, B.C. Ministry of Management Services.

18 Smoking (2000/01)
Note: Proportion who smoke daily or on an occasional basis.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

19 Regular heavy drinking (2000/01)
Note: Proportion who reported drinking 5 or more drinks on occasion, 12 or more times a year.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

20 Physical Activity (2000/01)
Note: Proportion who are physically active, based on their responses to questions about the frequency, duration, intensity of their participation in leisure-time physical activity.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 December).

21 Healthy eating (2000/01)
Note: Proportion over who consume fruits and vegetables 5 or more times per day.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

22 Living arrangements, 65+ (2001)
Note: Population age 65 years an over who lived in collective dwellings.
Source: Statistics Canada. 2001 Census. Population estimates for 65-74 and 75 years and older are from Health Data Warehouse (April, 2003).

GOAL 3: PHYSICAL ENVIRONMENT BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population
23 Exposure to second-hand smoke (2000/01) Per cent of non-smokers exposed to second-hand smoke	13.0%	7.8%	10.8%	(Age 12+) 19.8%

GOAL 4: HEALTH SERVICES

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population
24 Influenza immunization (2002/03) Participation rates	-	-	70.9%	-
25 Screening mammography (2000 and 2001) Participation rates		-	-	(Age 50 to 74) 49.0%
26 Pap smears (July 1999 to December 2001) Participation rates age 20 to 69	(60-69 years) 38.5%	(70+ years) 13.1%	-	(Age 20 to 69) 61.5%
27 Dental visits in past year (2000/01) Per cent who had contact with dental professionals	51.3%	43.7%	48.2%	(Age 12+) 63.4%
28 Unmet health care needs (2000/01) Per cent who said they did not receive needed health care	7.5%	6.9%	7.2%	(Age 12+) 12.1%
29 Breast-conserving surgery (2001/02)** Per cent of all breast cancer surgeries	58.5%	47.5%	53.3%	(Age 15+) 60.1%
30 Expected compared to actual stay (2001/02)** Expected Actual Expected minus actual	 5.85 5.68 0.17	 6.88 6.74 0.14	 6.46 6.31 0.15	 (Age 0+) 4.89 (Age 0+) 4.71 0.18
31 Alternate level of care (ALC) days (20001/02) Per cent of ALC	12.9%	26.9%	22.7%	(Age 0+) 14.76%
32 Community follow-up after hospitalization (2001/02) Per cent follow-up	62.4%	49.7%	54.3%	(Age 15 to 64) 72.6%

Notes and Sources

23 Exposure to second-hand smoke (2000/01)
Note: Non-smoking population who were exposed to second-hand smoke on most days in the month preceding the survey.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

24 Influenza immunization (2002/03)
Note: Proportion of population age 65+ in the community who received influenza vaccinations.
Source: Prevention and Wellness Planning Division, (2003 August) B.C. Ministry of Health Planning. Unpublished data.

25 Screening mammography (2000 and 2001)
Note: Proportion of women who attended the Screening Mammography Program of B.C. at least once in the past two years.
Source: BC Cancer Agency. *2001/2002 Annual Report, Screening Mammography Program*. Population data in the report was acquired through Health Data Warehouse, B.C. Ministry of Health Services and BC STATS, B.C. Ministry of Management Services.

26 Pap smears (July 1999 to December 2001)
Note: Proportion of women who had had a Pap test within the last 20 months.
Source: BC Cancer Agency. *2002 Annual Report, Cervical Cancer Screening Program*. Population data in the report was acquired through Health Data Warehouse, B.C. Ministry of Health Services and BC STATS, B.C. Ministry of Management Services.

27 Dental visits in past year (2000/01)
Note: Population who had contact with dental professionals in past 12 months.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2002 October).

28 Unmet health care needs (2000/01)
Note: Population who said they had at least one unmet health-care need during the previous year.
Source: Statistics Canada. Canadian Community Health Survey 2000/01. Prepared using Master Files, CANSIM II (2003 February).

29 Breast-conserving surgery (2001/02) **
Note: Proportion of female breast cancer surgery patients (ICD-9 diagnosis code of 174, acute, rehab, and day surgery levels of care) who received breast-conserving surgery.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

30 Expected compared to actual stay (2001/02) **
Note: Average days that acute care patients spend in hospital. compared to expected length of stay (based on patient's diagnosis, age and other factors). Positive differences between expected and actual mean efficiencies were achieved, provided patients remained healthy after discharge.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

31 Alternate level of care (ALC) days (2001/02)
Note: Number of days that Alternate Level of Care patients spend in acute care hospitals, as a proportion of all inpatient hospital-days.
Source: Information Support, B.C. Ministry of Health Services. Prepared using data from Discharge Abstract Database.

32 Community follow-up after hospitalization (2001/02) **
Note: Proportion of persons hospitalized for a mental health diagnosis who receive at least one contact with a community mental health centre or a fee-for-service psychiatrist or general practitioner within 30 days of discharge.
Source: Information Support, B.C. Ministry of Health Services. Prepared using several data sources - Mental Health Data Warehouse, claims data from the Medical Services Plan and Morbidity Database.

** 2001/02 data for these indicators are based on ICD10 coding. Data for previous years were based on ICD9 coding. Necessary steps were taken to present 2001/02 data by translating ICD10 to ICD9 and minimizing differences where translation may not be exact.

GOAL 5: ABORIGINAL HEALTH BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population
33 High school completion rate (2001)			(Aboriginal) 24.7%	(Age 65+ non-Aboriginal) 51.0%

GOAL 6: DISEASE AND INJURY PREVENTION BRITISH COLUMBIA SENIORS

Indicators	65 - 74 years	75 years and older	65 years and older	BC Population: Age 0 to 64+
34 Heart and stroke deaths (2002) Diseases of the circulatory system (I00-I99)	14.5%	75.1%	89.7%	10.3%
35 Cancer deaths (2002) All cancers (C00-C97)	27.1%	46.1%	73.2%	26.8%
36 Respiratory disease deaths (2002) Disease of the respiratory system (J00-J98)	13.4%	79.6%	93.0%	7.0%
37 Tuberculosis (2002) Number of cases	44	49	93	210
38 Unintentional injuries (2002) Number of deaths	-	-	429	706
39 Hip fractures (2001/02) Cases per 1,000 population, age 65 and older	-	-	8.3	-
40 Suicide (2002) Number of deaths	-	-	68	328

Notes and Sources

33 High school completion rate (2001)
Note: Proportion of the Aboriginal and non-Aboriginal population who have a high school graduation certificate or higher, based on the Census questions about educational attainment.
Source: Statistics Canada. 2001 Census.

34 Heart and stroke deaths (2002)
Note: For each age category, per cent of total deaths for diseases of the circulatory system (I00-I99), based on ICD-10.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

35 Cancer deaths (2002)
Note: For each age category, per cent of total deaths for all cancers (C00-C97), based on ICD-10.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

36 Respiratory disease deaths (2002)
Note: For each age category, per cent of total deaths for diseases of the respiratory system (J00-J98), based on ICD-10.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

37 Tuberculosis (2002)
Note: Number of active tuberculosis cases.
Source: B.C. Centre for Disease Control.

38 Unintentional injuries (2002)
Note: Number of deaths due to unintentional injuries
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

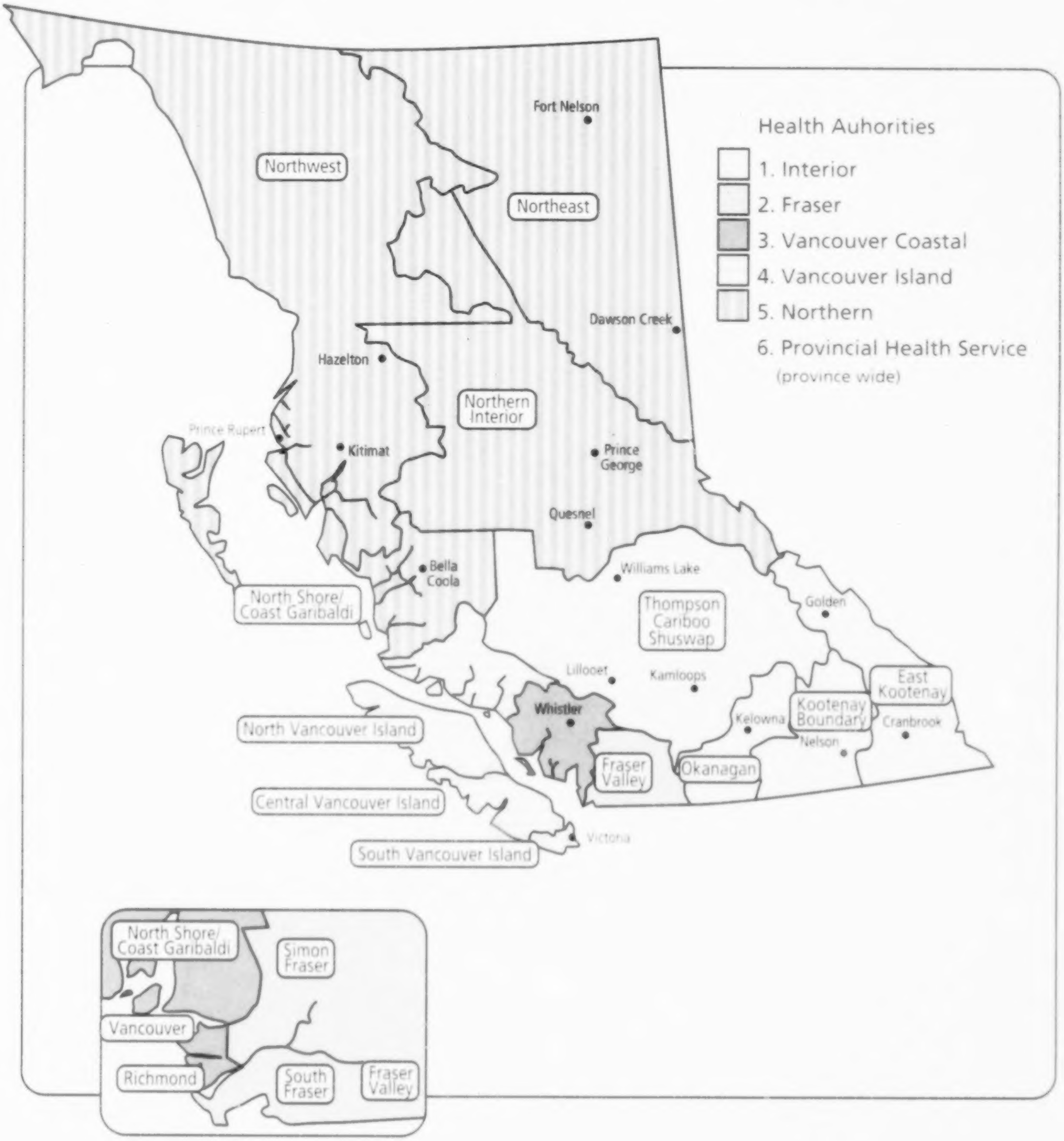
39 Hip fractures (2001/02)
Note: Number of hospitalizations for fractures of the hip (primary diagnosis of ICD-9 820.0-820.3, 820.8, 820.9), expressed as a rate per 1,000 population age 65 and older.
Source: Information Support, B.C. Ministry of Health Services. Prepared using Discharge Abstract Database.

40 Suicide (2002)
Note: Number of deaths due to suicide.
Source: B.C. Vital Statistics Agency, B.C. Ministry of Health Planning.

APPENDIX F

Map

British Columbia Health Authorities and Health Service Delivery Areas


Health Auhorities
1. Interior
2. Fraser
3. Vancouver Coastal
4. Vancouver Island
5. Northern
6. Provincial Health Service
(province wide)
Northwest
Northeast
Fort Nelson
Dawson Creek
Hazelton
Northern Interior
Prince Rupert
Kitimat
Prince George
Quesnel
Bella Coola
North Shore/ Coast Garibaldi
Williams Lake
Thompson Cariboo Shuswap
Golden
East Kootenay
Lillooet
Kamloops
Whistler
Kelowna
Kootenay Boundary
Cranbrook
Nelson
North Vancouver Island
Fraser Valley
Okanagan
Central Vancouver Island
Victoria
South Vancouver Island
North Shore/ Coast Garibaldi
Simon Fraser
Vancouver
Richmond
South Fraser
Fraser Valley

BRITISH COLUMBIA

Ministry of Health Planning

Office of the
Provincial Health Officer